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COST *and* MANAGEMENT

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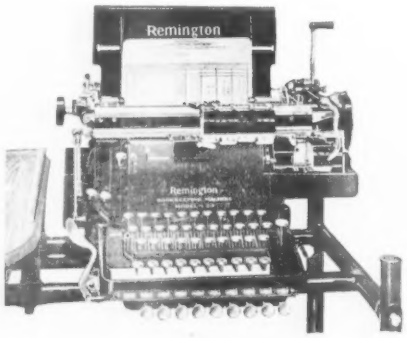

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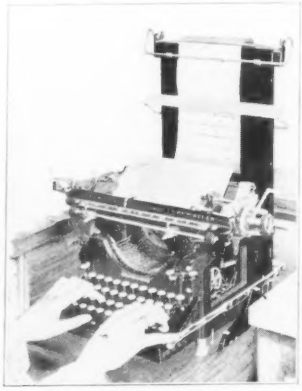

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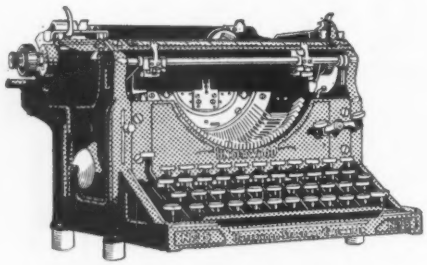

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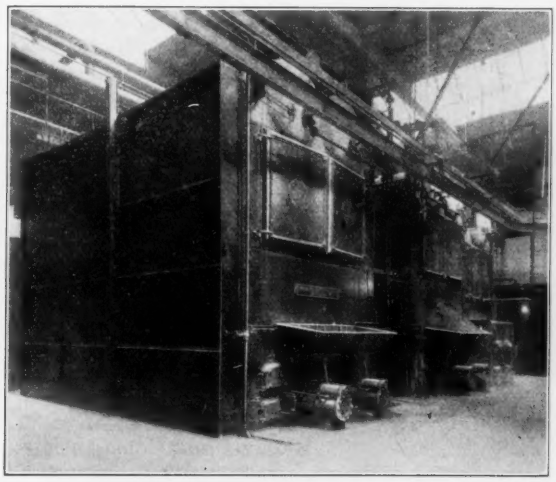

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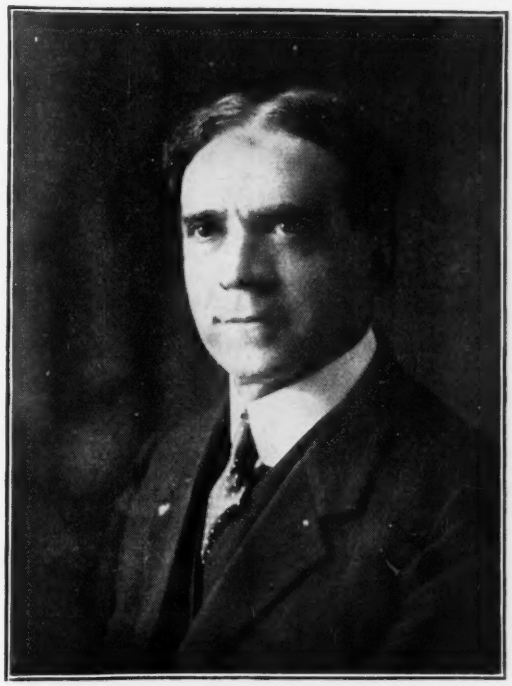

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Programme, Season 1926-1927

1926		
Oct. 14	**Cost Accounting from the Banker's Point of View.**	**J. P. Bell,** Manager-in-Chief, Canadian Bank of Commerce, Hamilton.
Nov. 4	**The Place of Cost Accounting in Industry.**	**A. B. Green,** Dominion Envelope and Cartons, Limited, Toronto.
Nov. 25	**Modern Cost Accounting.**	**John Craig,** President, Canadian Society of Cost Accountants, Toronto.
Dec. 16	**Wage Incentives.**	**A. E. Keen, C.A.,** Thorne, Mulholland, Howson & McPherson, C.A., Hamilton.
1927		
Jan. 6	**Business Cycles and Industrial Forecasting.**	**R. L. Wright, M.A.,** Vice-President, The Wahl Company, Limited, Toronto.
Jan. 27	**Cost Accounting in its Relationship to Municipal Administration.**	**A. P. Kappele,** Purchasing Agent for the City of Hamilton.
Feb. 17	**Depreciation in the Income War Tax Act.**	**C. S. Walters,** Inspector of Taxation, Hamilton.
Mar. 10	**Selling and Administration Costs and their Distribution.**	**James Turner, C.A.,** The T. Eaton Company, Ltd., Toronto.
Mar. 31	**Some Practical Advantages of Co-operation in Industry.**	**H. T. Jamieson, F.C.A.,** Riddell, Stead, Graham & Hutchison, C.A., Toronto.
Apr. 21	**Balance Sheet, Operating and Profit and Loss Statements.**	**S. E. Le Brocq,** The Steel Company of Canada, Ltd., Hamilton.

All Meetings will be held in the Chamber of Commerce Rooms, Corner Hughson and Main Streets, at 8 p.m.

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Programme, Season 1926-1927

1926

Oct. 1—**Budgets.**

Oct. 29—**Modern Cost Methods.**

Nov. 12—***Costs in Graphic Arts.***

Direct Labor Application.

Nov. 26—***Income Tax—Administrative Rulings.***

The Operation of a Modern Cost System (Part 1).

Dec. 10—**Internal Audit of a Public Utility Company.**

The Operation of a Modern Cost System

1927 **(Part 2).**

Jan. 28—**Trust Problems.**

The Operation of a Modern Cost System (Part 3).

Feb. 11—**Accounting Principles for Cost Accountants.**
Handling Stores.

Feb. 25—**Plant Depreciation.**

Mar. 11—**Subject to be Announced.**

Maintenance Costs.

Mar. 25—**Use of Costs for Better Management Practice.**

Apr. —**Annual Dinner.**

(Date, Place and Speakers to be announced).

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Boston, Mass.
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Canadian Society of Cost Accountants.
E. S. Richardson,
Graphic Arts Section, Canadian Manufacturers' Association.
F. Fernie,
A. R. Whittall Can Company Limited.
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Assistant Inspector of Taxation.
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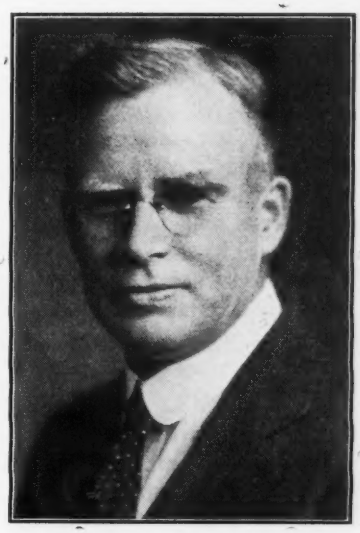

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Programme, Season 1926-1927

1926 Oct. 13	**Principles Underlying City Estimates and Budgets.**	**George H. Ross,** Commissioner of Finance and City Treasurer.
Oct. 27	**Specific Subjects to be announced later.**	**Members of the Society.**
Nov. 10	**Determining Materials Required; Buying and Assembling.**	**R. M. Sedgewick,** Purchasing Agent, The Standard Chemical Company.
Nov. 24	**Plant Engineering and Handling Labor.**	**H. F. Wilson,** Production Engineer, Wilson & Fessenden, Kitchener.
Dec. 15	**Preparation and Administration of Budget.**	**H. A. Brown,** Comptroller, General Motors of Canada, Limited, Oshawa.
1927 Jan. 12	**The Pulse of Business.**	**Geo. Wilson,** President, Board of Trade, and General Manager of White Pine Bureau.
Jan. 26	**Selling and Marketing.**	**J. Allan Ross,** President, Wm. Wrigley Jr. Co., Ltd.
Feb. 9	**The Operation of a Standard Cost System.**	**J. E. Carruthers,** Export Manager, Durant Motors of Canada, Ltd., Leaside.
Feb. 23	**Costing Life Insurance.**	**J. H. Lithgow,** Actuary, Manufacturers Life Insurance Co.
Mar. 9	**Factory Overheads and their Distribution.**	**C. H. Black,** Cost Accountant, Dunlop Tire & Rubber Goods Co., Ltd.
	Selling and Administrative Costs and their Distribution.	**James Turner, C.A.,** T. Eaton Company, Limited.
Mar. 23	**Interim Monthly Statements and Annual Balance Sheets.**	**R. J. Dilworth, F.C.A.,** Clarkson, Gordon & Dilworth.

Meetings will be held in the Board of Trade Rooms, Royal Bank Building, at 8 p.m.

Chapter Notes

MONTREAL CHAPTER NOTES

OCTOBER 29th, 1926, will be a memorable date with the Montreal Chapter. It was our first meeting in the new Arts Building of McGill University, to which we were welcomed by Professor Thompson. All present agreed that arrangements were most satisfactory and a unanimous vote of thanks was passed to the University and Dean MacKay for their kindness. Several important statements were made at this meeting. The next Convention is to be held in Montreal and several Committees were named. Our Speaker, Mr. John Craig, told the meeting about our Magazine, the success of which, judging by the applause which greeted his remarks, is assured.

Mr. Craig's paper was followed with much interest, the Secretary being kept busy with the blackboard for emphasis. We were treated to explanations of terminological differences in the Science of Cost Accounting, all of which, however, were overshadowed by the most expressive phrase —"Cost Accounting is the Science of Causation of Cost."

During the evening several comparisons were made between General and Cost Accounting, and the usual text book method of compiling Costs was completely reversed by the Speaker. In illustrating this he proves that Overhead is the first Cost. Some differences of opinion were stated at the close of the meeting, but it was difficult to disprove the Speaker.

A unanimous vote of thanks was passed to Mr. John Craig for his excellent paper.

Inclement weather must have been the reason for so many members not attending the November 12th meeting. Mr. E. S. Richardson of the Graphic Arts Section of the Canadian Manufacturers' Association outlined the Typothetae System of Cost Finding in the printing and kindred industries. From the detail given us and the explanation of Typothetae Methods, it looks as though industries of similar types would be much benefited by operating on a Standard Cost Finding System. Our old friend "Interest" finds a place in the Typothetae scheme of things. The value of this standard method was clearly proven by the Speaker, particular emphasis being placed on peculiar facts in the Printing Industry, such as the dissimilarity of jobs and all production is sold before setting up, which suggest themselves a fool proof method for estimating. It would seem, from Mr. Richardson's explanation of their method, that the printing industry has a "Stop Loss" remedy within their grasp if they will only use it. This speaker prepared the Chapter for Mr. E. L. Rhodes of the Consolidated Lithographing Co., who starts at our next meeting to go into the detail of this Cost System as it is being used. A new definition in terminology was introduced, the French literal translation of "Overhead" as "up in the air" costs.

The second paper of the evening was given by the Secretary, Mr. F. Fernie, of A. R. Whittall Can Co., Limited, who explained the method of compiling and applying the Direct Labor on making a Sanitary Can or Food Container. This was explained with the use of forms and illustrated with the results of the different processes that tinplate goes through to make a can. During the balance of the programme we are to hear from several members on methods in use. From the discussion of such papers there is expected to develop improvements on methods in use by members through the interchange of practical experience.

F. FERNIE,
Secretary, Montreal Chapter.

TORONTO CHAPTER NOTES

AT the meeting of the Toronto Chapter, held October 27th in the rooms of the Board of Trade, three very interesting papers were given. Frank Tucker, Secretary-Treasurer of Langley's, Limited, exhibited charts and graphs designed to enable the Cost Accountant to "sell" costs to executives, and emphasized the importance of careful preparation of such data, so that the executives can arrive at a correct conclusion in the space of a few minutes. Messrs. Carruthers and Green, discussing the paper, both advocated the use of graphs, since very often trends of business can most clearly be shown by comparative average charts.

Mr. John E. Pile, assistant to the Chief Accountant, Hydro-Electric Commission of Ontario, gave the second paper on Plant Construction and Records, outlining, to some extent, the methods used by the Commission, and pointing out some of the difficulties that have to be met in allocating operating expenses against the Capital accounts. This paper was followed by one given by the Chairman, T. S. Jardine, on Plant Maintenance and Costs, in which he advocated that the Cost Accountant acquire the engineering viewpoint, stating that Cost Accounting and Plant Engineering are so closely allied that there must be full and complete co-operation between these departments of the business. As an experiment, the members were asked to wait for a time after the meeting so that they might become better acquainted. This proved to be a real success, and the idea will be tried out further, hoping that it will become a regular feature of Toronto Chapter meetings.

The third meeting of Toronto Chapter on November 10th, was well attended, and Mr. R. M. Sedgewick, Purchasing Agent of the Standard Chemical Company, gave an exceedingly well-prepared paper on "Determining Materials Required, Buying and Assembling." He pointed out "that there is no more vital spot in an organization than the Purchasing Department, no one place where the profits can be so advantageously secured, or where losses can be more easily incurred." In the discussion which followed it was brought out that close-working relations between the Cost Accounting Department and the Purchasing Department were necessary for the welfare of each.

The discussion of Mr. Sedgewick's paper was followed by Mr. George C. Dent, Executive Secretary of the Society of Industrial Engineers, who gave a very complete outline of the work of his society in the U.S.A. This meeting also was closed with the social half hour, as was the previous meeting, and is still proving a success. It has encouraged greater friendliness among our members and has more quickly brought our new members into the circle.

R. A. BURDETT,
Secretary, Toronto Chapter.

HAMILTON CHAPTER NOTES

AT a recent Executive Meeting of the Hamilton Chapter, Mr. A. J. Finck, of the Moto Meter Company of Canada, was elected to the office of Vice-Chairman, made vacant by the resignation of Mr. Noel Bassin. Mr. Finck is a very capable man in the field of Cost Accounting and an active worker, therefore it is certain that his ideas and efforts will be of great benefit to the Hamilton Chapter.

Welcome, Mr. Finck!

Mr. S. G. Richardson was elected to fill the vacancy caused by Mr. Bassin's resignation, on the Board of the C.S.C.A. Although Hamilton has only two representatives on the Board,—namely—Messrs. Donaldson and Richardson, we feel certain that the interests of the Society and of this Chapter will be well looked after in their experienced hands.

A roll call has been introduced at the regular meetings of the Chapter, and each Senior and Junior Member, when called, rises and gives his name and business occupation. This not only insures an accurate attendance record but adds the necessary "personal touch."

On Thursday, November 4th, Mr. A. B. Green, Director of Production, Dominion Envelope and Cartons, Limited, Toronto, addressed the Chapter on "The Place of the Cost Accountant in Industry." Mr. Green, in a very interesting and well thought out paper, stressed the wide sphere that was at the disposal of the Cost Accountant, contrary to the general belief that the field of the activities of the Cost Man was greatly limited. He also outlined the ground the Cost Man should cover in order to widen his sphere and to justify his own importance. Mr. Green described at some length various schemes of putting together Cost information.

On November 25th Mr. John Craig, President of the Society, will speak on "Modernized Cost Accounting." Mr. Craig takes the view that many of the present Cost Accounting methods are hopelessly out of date inasmuch as they are not founded on any definite principles and are unsuitable for present day industrial conditions.

We understand Mr. Craig proposes to show how Cost Acounting Systems and Methods should be designed to further production control and form a basis for executive policy.

G. E. F. SMITH, Secretary,
Hamilton Chapter.

CORRESPONDENCE

Hamilton, Canada,
November 12th, 1926.

John Craig, Esq.,
President,
Canadian Society of Cost Accountants,
95 King St. E.,
Toronto, Ont.

Re:—C.S.C.A.

Dear Mr. Craig:—

The enclosed letter addressed to you was handed to me to-day with the threat that if I did not send it on to you with any defence I might have to offer, the writer would have it published in the Toronto and Hamilton newspapers.

You will notice that the writer desires publication in Cost and Management, but as there is much truth in what he has written (I was personally present on all occasions referred to) it may not be considered quite suitable for the magazine. My defence as the writer of the alleged false notes will be based on these premises.

There is no doubt that the aggrieved member will insist on having his paper read at the next Hamilton lecture meeting.

Your advice will be appreciated.

G. E. F. SMITH,
Secretary, Hamilton Chapter, C.S.C.A.

P.S.—His selection of a nom-de-plume is strange.

John Craig, Esq.,
President,
Canadian Society of Cost Accountants,
Toronto.

Sir:—

I am a member of the Executive of the Hamilton Chapter and have a good record (I mean in attending the meetings and lectures of the Hamilton Chapter).

Each lecturer to whom I have been compelled to listen has stressed the point that truthfulness is paramount in his own life and should also be so in the life of a less able man or Cost Accountant.

Without necessarily believing in the confessions of the lecturers, there is no doubt something in being truthful and because of this I feel that it is my painful duty to inform you as President of the Society, that the writer of the Hamilton Chapter Notes is allowing truth to sink into flattery.

I am, therefore, giving you a true account of the activities of the Hamilton Chapter since the last issue of the magazine, which you will please publish side by side with the false.

At a recent Executive meeting of the Hamilton Chapter, Mr. A. J. Finck of the Moto Meter Company of Canada was elected to the office of Vice-Chairman.

The office had been vacant for some time and it had been thought unnecessary to fill it so long as the Chairman was alive. The Chairman, in spite of the lectures, never misses a meeting, thoroughly enjoys being present, thumps the table and brings eyes front with enviable skill, and occasionally, like Mr. Wegg, "drops into poetry."

The outbreak of smallpox did more than anything else to make the Executive realize that more than one man should be trained in the useful art of table thumping.

Mr. Finck's election was peculiar and not, as the writer of the "Notes" will no doubt claim, popular.

Judge for yourself.

Each member of the Executive nominated another member and then voted for himself. Countless ballots resulted in a perfect deadlock, and as no nominee would willingly withdraw it was decided to toss a coin. Mr. Finck tossed the coin and of course won.

After his election, Mr. Finck was asked to say a few words and give a sketch of his life.

Thus spoke Mr. Finck.—He appreciated the honor of his elevation—A better choice could not have been made.—Something might happen at any time to the Chairman although he was at least physically fit.—He hoped his opportunity would come and then the electors would know that their confidence had not been misplaced.—Until that time he asked their indulgence and so on and on.

Mr. Finck then opened up on his life, commencing with the statement that he had never been a better man than he was to-day. The sketch idea was then dropped.

Touching upon Cost Accounting Mr. Finck said he knew little about it but that he would be pleased, as other members in the same situation had done, to give a paper on the subject. I think he said his paper would rank with any or he may have said "as rank as any."

At this same meeting a member expressed the opinion that the atmosphere of the lecture meetings was too chilly. Members did not address one another as Bill and Dick, nor even go the length of saluting one another at all. The atmosphere was altogether one in which a person might be expected to learn only something useful and not at all calculated to keep the members from flying off to a dog fight or hockey match. The meeting was pondering over such questions as: Should the Chairman salute each arrival on either cheek French fashion? Should cigars, sticks of chewing gum, cups of coffee be passed around? Should the lectures be intercepted by the singing of hymns?—When someone whispered wait until after the first of December!

Mr. S. G. Richardson was elected to fill the vacancy caused by Mr. Bassin's resignation on the Board of the Society. The Chairman is the other member representing Hamilton and as I have already said something about that gentleman, it would be unfair to pass by Mr. Richardson.

Mr. Richardson was chosen to fill the vacancy because he had a motor car, liked Toronto, had nothing to do and did not play golf. With these recommendations he should be of great service to the Board.

Mr. Richardson, although a Chartered Accountant, is interested in Cost Accounting. He has installed many and varied systems, one at least of which is still in operation.

In order to make the meetings a little more lively a roll call of members was instituted at the last lecture meeting. Each member is supposed to rise, give his name and business and sit down quickly. Some of the members took advantage of this privilege by remaining on their feet for a sufficient time in which to advertise their businesses or the products of their firms. The new Vice-Chairman was particularly conspicuous in this.

As Mr. A. B. Green was to lecture before the Chapter on November the 4th, the Secretary was kind enough to invite that gentleman to dinner. Mr. Green was hungry and Scotch enough to accept. He duly arrived, accompanied by the uninvited President. What was the Secretary to do? He is a poor man. He protests. The President retorts that by virtue of his office he may dine anywhere at any time at any member's expense. The Secretary cannot reply—he does not know the new Constitution.

The Toronto visitors went through the bill-of-fare as though they had purposely denied themselves luncheon. The Secretary wondered if they had come to Hamilton for any other purpose, and if so, how they were going to achieve it.

Filled with salmi of duck the unblushing Mr. Green at 8 o'clock on the evening of November the 4th last, faced his audience. He held in his hand a large quantity of paper sufficient to account for the abnormal waste over a long period in his own business.

The lecturer was not, as his audience thought, about to distribute a lot of the products of his firm. No! What he held in his hands was closely filled with typewritten matter. It was his speech. He said so, and the audience that thought it was going to get something sat back disappointed.

"Is he going to read all that stuff?" was whispered from ear to ear, and had Mr. Green been an observant man instead of a production manager, the members might have got away to their serious affairs much earlier.

Mr. Green, however, after assuring his audience that he was not going to read all that the members were afraid he might, proceeded to wade through page after page. If he missed one it was not intentional nor apparent to the members, each of whom was carefully checking over the sheets as they were transferred to the back of the pile. The lecturer even added remarks to the wrotten matter [Perhaps this is a stenographer's mistake for "written"—Ed.] raising his head and smiling as these were delivered. The remarks, no doubt, helped him to understand something of what he had written.

He went through the whole subject of Cost Accounting, leaving nothing unsaid and rendering unnecessary all the lectures of the Hamilton programme to follow.

Discussion provoked by the less intelligent members of the Chapter gave Mr. Green the chance of replying to many questions. His replies were made in the usual manner of high-class lecturers, that is, to leave the questioner in doubt and so give the next lecturer the same opportunity of passing on the answers.

Mr. Craig joined in the discussion. Mr. Craig has the happy knack of introducing funny stories into his serious speeches. These funny stories have nothing to do with Cost Accounting, at least, I mean anyone might instal a cost system without having to remember one of them. Funny stories, however, do serve a useful purpose in that members may laugh immediately afterwards and at the same time hide the real cause of their mirth. The feelings of the lecturer are never hurt if each member can hang on until the next funny story.

Purely as a matter of form a hearty vote of thanks to the lecturer and President was proposed and seconded. The members suppressed their feelings like trained soldiers so that opposition was not even suspected and the Chairman was compelled to declare the motion carried.

Mr. Craig and Mr. Green left for Toronto on the bus leaving at 10 o'clock. They first thought of leaving at 11 o'clock as there was not a later bus, and generously offered to lecture and talk to the members all the time they were in Hamilton. The Secretary to whom the offer was made, felt that he could not take advantage of it but suggested that the distinguished visitors should take the 10 o'clock bus and lecture and talk to one another on the way home, letting the members know all about it afterwards. In this way everyone would get to bed earlier and no important information would be lost. The Secretary's suggestion was adopted.

On November 25th next Mr. Craig will speak on "Modern Cost Accounting." Perhaps he knows something about it. It is not for me to say before his lecture that he does not. Whether he does or does not, Mr. Craig will be, as he always is, very interested in what he is saying, and if he will inform the Secretary in time that he has some new stories "up his sleeve" a large attendance will be assured.

This, Sir, is the correct version of the current Hamilton Chapter Notes.

Yours truthfully,

ULTRA VIRES.

The University of Minnesota
School of Business
Minneapolis

Nov. 10, 1926.

The Canadian Society of Cost Accountants,
Toronto, Canada.

GENTLEMEN:

My attention has just been called to the fact that you are starting the publication of a new magazine on Cost Accounting.

Although I have not seen a sample copy of it, I am enclosing my check for Five Dollars ($5.00) for one year's subscription, which you will please address as above.

Owing to the fact that this field is not adequately covered by literature published in the States, you should be very successful in building up a good subscription list here if your journal has the merit that I feel sure its distinguished sponsorship assure it.

Very truly yours

.....

P.S.—Please send me the September Number. I want my files complete.

COST AND MANAGEMENT

OFFICIAL JOURNAL OF

THE CANADIAN SOCIETY OF COST ACCOUNTANTS

Incorporated 1920

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IN this issue we are privileged to present, through the courteous permission of the **Shaw Schools Limited**, who own the copyright, an interesting article on Economics, extracted from the course "Applied Economics," by Sedley Anthony Cudmore, B.A. (Tor.), M.A. (Oxon), formerly Assistant Professor of Economics, University of Toronto and latterly of the Dominion Bureau of Statistics, Ottawa. Some knowledge of the principles of Economics is not only necessary for the Cost Accountant, but is of importance to those who hold executive positions. The chief problems which confront the modern world are economic problems. The organization of Production, the Exchange of Service and Products, the Distribution of Material Means as well as the use of them by the people, have all been altered by the tragedy of the great war. Some acquaintance, therefore, with the Science of Economics viewed in the light of present-day problems, is of supreme interest to those who aspire to positions of importance in the business world for Economics may be defined as *The Science of Business.*

AN APPRECIATION

WE have much pleasure in reprinting the following paragraph from section II. of the N.A.C.A. Bulletin of November 1st. The editor wishes to note his appreciation of Dr. McLeod's kind remarks, and to express the hope that the relations between the N.A.C.A. and the C.S.C.A. may long continue on this friendly footing.

"A New Cost Magazine

The Canadian Society of Cost Accountants is bringing out as its official journal a magazine entitled "Cost and Management." September, 1926, issue constitutes Volume I, No. 1, and is devoted chiefly to the society convention held in Toronto during September. It is the purpose of the management to publish papers on cost accounting subjects which have been presented at various of its chapter meetings, to include also reprints of cost articles appearing in other periodicals, particularly English periodicals, and to carry each month a digest of the best current literature in cost accounting. The subscription price is five dollars a year. The editorial office is 95 King Street East, Toronto. The first issue of the magazine is a good piece of work from the standpoint of the printers' art and its content is of a high grade. We offer our congratulations to the Canadian Society upon its accomplishment."

MORNING POST, LONDON, ENGLAND

Monday, November 1, 1926

"COST ACCOUNTING

WE welcome the first number of *Cost and Management*, the official journal of the Canadian Society of Cost Accountants, a Society which was formed in 1920, and is now launching an active campaign to promote the study and application of the science of Cost Accounting. The new journal is edited by Mr. John Craig, of Toronto, who is President of the Society, and one of the most experienced Cost Accountants in the Dominion, while the directorate includes Col. R. R. Thompson, Professor of Accounting at McGill University. The value of the paper, especially at a time when Canada appears to be upon the eve of another great forward industrial movement, is plainly evident, and as it is intended to publish in it the best papers given at the meetings of the Society at its various branches in the Dominion, as well as special articles, it will no doubt be of value to accounting circles outside the Dominion as well as within it. The Subscription price of the journal, which is published monthly, is $5.00 per annum."

LARGE FACTORIES

THE advantage of the large plant over the small one lies chiefly in the field of purchases and sales. In actual production the small plant can frequently compete with the large one on even better terms. It is said that only about 1% of United States factories are large enough to employ 500 workers or more, and these employ only about 40% of the wage-earners in factories. The other 60% of the wage-earners is to be found in factories employing from 500 workers down to those employing 20 and even fewer.

"COST AND MANAGEMENT

The New Official Organ of the C.S.C.A.

THE Canadian Society of Cost Accountants this year enters upon a further phase of its activities by inaugurating the publication of a monthly journal under the above caption. This Society, which was incorporated in 1920, chiefly by the exertions of Chartered Accountants, now includes in addition a large number of Business Executives and Cost Men throughout the Dominion, who meet at frequent intervals to exchange ideas and promote the study of the Science of Costing. At the first convention, held on the 9th of September last, Mr. Jno. Craig, President, made the announcement on behalf of the Board of Management that the Society had now learned to stand upon its own feet and would publish its own literature. The convention was splendidly attended and the proceedings were marked by much enthusiasm. The journal makes its initial appearance with a circumstantial account of this meeting and of the incidental dinner gatherings which were addressed by persons of distinction, including Sir Joseph Flavelle, Bart., and Sir Hugh Poynter, Bart."

(*From The Canadian Chartered Accountant*)

COST OF BUSINESS

ONE of the great problems of industry to-day is the *cost of doing business.* To meet competition in our own and other countries some means must be sought to reduce the Cost of business.

The facts obtained through an adequate Cost System have kept many a factory running when its competitors have had to close their doors.

IF THE CAP FITS WEAR IT!

THE Standard Oil Company in its house organ has this to say about the Price Cutter:

"The price-cutter is worse than a criminal. He is a fool. He not only pulls down the standard of his own goods; he not only pulls down his competitors; he pulls himself down and his whole trade. He scuttles the ship in which he, himself, is afloat. Nothing is so easy as to cut prices; and nothing is so hard as to get prices back, when once they have been pulled down. No manufacturer can permanently keep up the standard of his goods if the price on them is specifically cut. Pretty soon he is compelled to use cheaper materials and to cut down the wages of his workers. The price-cutter admits he cannot win by fighting fairly. He brands himself as a hitter below the belt. If the business world was dominated by price-cutters, there would be no business at all."

MR. NOEL M. BASSIN

WORD has been received from Mr. Noel M. Bassin that he is likely to be detained for some time in Brazil. The letter of resignation, which he forwarded, was therefore laid before the directors in Toronto, who recommend the election of Mr. S. G. Richardson, C.A., a member of the Hamilton Chapter Executive, to fill Mr. Bassin's place for the balance of the year, as one of the directors from Hamilton.

The directors express their appreciation of Mr. Bassin's services as a director of the Society, and hope to see him again on the Board of the Society on his return to Canada.

WE have received the November issue of the Typothetae Bulletin which is a very excellent production. We note that the United Typothetae have organized a course in *"Selling Printing"* and have already received an enrollment of over 1,000 members desirous of taking this course. It is well to note what other Associations are attempting in the line of Education of their members. Education in Selling is as important as Education in Producing. Regarding the work of the Canadian Society of Cost Accountants we are inclined to think that hitherto not enough attention has been paid to Accounting for the Cost of Selling and Distributing. It is noteworthy that while production costs are on the down grade the Costs of selling and distributing are on the increase and some attention should be paid to this feature.

DOES YOUR COST SYSTEM GET RESULTS?

IT is the customary practice for most business firms to have their financial books and records of account subjected to an examination by an outside accountant or firm of accountants. The value of having the financial books of account audited regularly lies principally in the fact that it inspires confidence on the part of the executives in their records. They know that facts have been impartially presented.

Is your cost system giving results? Is it of real value to you or could you manage your business as well without it? Did you ever think of having your cost system audited? There is no more reason why your cost system should not be audited regularly than there is to get along without a periodical examination of your financial records. A cost system is installed as an aid in management. If the cost system is not giving information that is indispensable to the executives, then it is not functioning properly. Something is wrong and your local's Cost and Accounting Bureau will tell you what it is.

(*"Typothetae Bulletin," Nov., 1926.*)

Cost Accounting from the Banker's Viewpoint

By J. P. BELL

Manager in Chief, Canadian Bank of Commerce, Hamilton

[Paper read at the Hamilton Chapter, C.S.C.A.]

IT is very difficult to say very much if I am to confine my remarks strictly to the subject for consideration this evening. In fact, my remarks might be as brief and to the point as those attributed to Mr. Calvin Coolidge on a recent occasion when his wife asked him what the sermon was about that Sunday morning. He said, "It was about sin." She said, "Well, what did the preacher have to say?" "He said he was against it." On the same principle I might sum up my views on Cost Accounting by saying, "I am in favor of it."

After a good many years' experience in the banking problems of all kinds of manufacturing accounts, I have come to the conclusion that in this age of keen competition the very existence of a manufacturing concern depends on its being able to reduce its operating costs to the minimum. This can only be accomplished by the most careful analysis of every item entering into expenditure, whether productive or non-productive, and to do this successfully requires a thorough knowledge of all the departments of a manufacturing business.

MR. J. P. BELL

In former times, when the country was being opened up in what might be called its constructive period, money was easily made by many manufacturers with more or less "rule of thumb" methods, and it is characteristic of aggressive and enthusiastic men to plunge merrily along without stopping long enough to consider the little items which go to make up costs and economies; but when things are more or less stationary, or periods of depression are being experienced, when red figures begin to appear in the balance sheets and profit and loss accounts, the banker who makes a careful analysis of them over a period of years usually finds there is something wrong either with the management or costs or both. It is his policy to discuss these matters frankly with his customer with a view to assisting him to handle his business at a profit.

Let me emphasize that the most important and necessary factor in the relations between a borrower and his banker is frankness. When a manufacturer opens an account he not only confers on his banker the favor of getting what he invariably considers is a good account with the possibilities of making profit by lending him money and handling his collections, but he also takes with him his difficulties and problems, and if he is not prepared to discuss these frankly and weigh the advice which the banker tries to give him from his experience with accounts of other businesses, then he had better put sufficient capital in his business to avoid the necessity of borrowing any money from his banker.

The first essential to an intelligent understanding of the problems of a manufacturing business is a reliable and thorough system of accounting, one that will show the costs and efficiency records and tie up the factory operations with the balance sheet. This will require evidence produced as to the cost of each operation, its efficiency both in time taken and the quality of the product and the actual cost of each item. It is not necessary for me to elaborate this part of the subject on which you are all so much better informed than I am, particularly as it is your life work to be able to present a true picture to a proprietor or manager of a business, but it occurred to me that it might be of some value to you, particularly the younger men present, to review briefly the system under which bankers lend money and give credit.

THE BANK AS A DEALER IN CREDIT

There is a very prevalent misunderstanding as to the basis on which a bank gives credit and you often hear comment made that certain concerns had to go out of business because the bank would not lend them any more money, whereas it was really because the means of the proprietors were exhausted and the necessary capital was not forthcoming instead of more banking accommodation. At the risk, therefore, of wearying some of you with a repetition

of statements and principles with which you are thoroughly familiar, I shall evnture to say a little on the functions of a bank as a dealer in credit.

Our modern industrial system with its interchange of commodities would be quite impossible if it were not for the facilities afforded by the banks. Before they existed people, even in this country, had to resort to barter and take their wool and hides and butter to the stores who supplied them with boots and shoes, clothing, and implements. If a man were a manufacturer of umbrellas he might once pay his workmen their wages by giving them each an umbrella, but if the workmen are to spend their wages they must either sell the umbrella or receive from the maker a power to transfer his debt to others. The solution of this difficulty involved the intervention of a dealer in debts, that is, a bank. In its simplest form, an umbrella manufacturer delivers his umbrellas to certain shopkeepers and draws his drafts upon them which the bank discounts or buys, and this furnishes him with the funds to pay his workmen.

The Function of a Bank

But in the great complexity of business and the multitude of commercial activities with which we are now surrounded, this is only a small part of a bank's functions, and it is called upon to make direct loans to the manufacturers, as well as to the farmers and cattlemen who are engaged in agricultural production, and to the wholesalers and jobbers who are engaged in the distribution of goods. These are the legitimate uses for bank accommodation, but it is astonishing how many people seem to think that it is not a bank's business to enquire as to the purpose for which the money is going to be used if the credit of the borrower is good or the security sufficient, and yet the bank is the custodian of the people's wealth and must as a trustee see that its funds are used for proper purposes to avoid too many non-banking loans which might on the face of them be safely secured, but are for speculation in stocks or real estate, or for personal extravagance. It is also no part of its business to lend money to build factories and install machinery and thus lock up its resources unless it has been definitely agreed and if possible arranged that these advances will be repaid either by the placing of a mortgage or the issue of bonds, and certainly they must never be sufficiently encouraged to be at the expense of the legitimate use of the bank funds.

When you consider the great extent and variety of business activities in Canada, it is difficult to understand how one man can successfully make loans in different parts of the country, and yet this is continually being done by bankers who may be for a certain length of time in Nova Scotia or New Brunswick where money is lent to fishermen and lumbermen, in Ontario and Quebec to manufacturers and farmers, in the Prairie Provinces to farmers and cattle ranchers, and in British Columbia to miners and lumbermen. The reason is to be found in the fact that the basic principles of making loans and extending credit are the same no matter what may be the character of the business or its geographical situation.

The Fundamentals of Credit

When the banker is called upon to consider an application for credit there are three fundamentals to be considered, and they all begin with the letter "C". They are: Character, Capacity and Capital. The first two might be called the moral risk, the last, the physical risk.

Let us take as an example an application from a manufacturer of shoes in Ontario for a credit of say $150,000. In order to show the variety of points on which the banker should satisfy himself, the following is a list of questions prepared by a standard authority:

The Banker's Catechism

Are the borrower's antecedents and character good?

Are his personal drawings from the business large?

Has he ever failed or had a suspicious fire?

Is he well liked and respected in the community?

Does he kite notes or cheques?

Is he in good health? His age?

Is he what is known as a "rebater," a man who makes unfair claims for goods in the hope of getting rebates or other concessions?

Can reliance be placed on his statements?

What are his personal habits?

How does he spend his evenings?

Has he technical ability in his business?

Are his books properly kept?

Does he extend credit too freely or without discrimination?

Does he cut prices?

Is he careful and discriminating in the purchase of his stock or does he carry an unnecessarily heavy stock?

Is he inclined to dabble in outside ventures such as real estate or stocks?

Does the business depend on conditions that may not be permanent?

Does he allow his machinery to become out of date and inefficient?

Does he study the particular wants of his trade with a view to meeting public demands?

Are his accounts receivable and bills receivable all genuine collectible accounts or are they padded with slow or worthless paper?

Does he take advantage of all trade discounts?

Are his sales out of proportion to his capital?

Is his position improving year by year?

Has he any large contingent liability?

Are all his liabilities given in the statement?

Are his profits and expense accounts in proportion to his sales?

Does he buy his raw material before he is reasonably sure of the amount of his sales?

Is he over-ambitious and anxious to extend his plant out of all proportion to his working capital?

Does he turn his capital quickly, or as many times as his competitors in the same line of business?

Does he always plan ahead in regard to his financial engagements, and know where the money is to come from?

Has he made provision for continuing his business in case of death?

Does he advertise wisely?

Is the line of goods he manufactures or sells one which is easily affected by changing fashions or seasons?

How does his annual sales compare with his stock on hand and bills payable and receivable accounts?

On what basis is the inventory taken and by whom?

Are his books audited by a chartered accountant?

There are quite a few more as to the man's family, whether they are of assistance or a drag on him, as to his position with reference to life insurance, whether it is payable to his estate so that in the case of his death it could clear up his liabilities without liquidating the business, or whether he has thought only of insurance payable to his wife.

Necessity for a Liquid Surplus

When the banker has satisfied himself on these various points he must study the financial statement, including the Trading Account and Profit and Loss Account, and the first and most vital feature is what working capital is disclosed. *A Liquid Surplus is the Corner Stone of Safe Lending.* If it is smaller it either indicates the business is being operated at a loss or poorly financed. The Proportion which the liquid assets bear to the floating liabilities varies with different kinds of business. For example, in a milk distributing business the liquid surplus does not need to be very much, as milk is usually paid for by the householder buying strips of tickets in advance, and the distributor pays the farmer who supplies him once or twice a month; whereas a lumberman requires a large liquid surplus. He has to cut his logs in the winter and allow his lumber to season after it is sawn in the spring and summer before he is able to bring it to market.

Take for instance a Shoe Manufacturer's statement. It shows an inventory of $130,000, Accounts Receivable $100,000 (this includes trade paper—bills receivable—$50,000). He shows liabilities to the Bank of $100,000 and to the trade $40,000. It will be noted that the Receivables are one-third of the sales which means that an average of four months' credit is given, although the manufacturer reports the sales terms as sixty days. Either that or there is an undue amount of dragging accounts on his books. The Profit and Loss statement shows a $500 loss after writing off bad and doubtful debts but before $5,500 of depreciation. There is evidently something wrong.

Investigation shows that the business has paid good dividends for several years, when the money ought to have been conserved to meet the slump in prices. The credit, too, has been weak. A new Superintendent has been engaged and says that more attractive goods must be turned out which requires investing in new machinery $20,000. An examination of the inventory shows a lot of old and slow-moving stock and the necessity for an inventory reserve of $25,000. It is quite evident that this business does not warrant larger bank loans, but more capital to invest in fixed assets and better methods of accounting with a proper system of budgeting in future.

Budgeting

Speaking of budgeting, you will be interested to learn that the Managers of the Canadian Bank of Commerce now have to budget the probable course of their business every month and for six months ahead, and we hope soon before the close of our financial year, to have a picture of what our next year's business is likely to bring. Setting objectives for the course of loans and deposits and the various items of expense is proving to be an excellent incentive to the management. It keeps them in much closer touch with the pulse of their business and much more cautious about casual expenses in order to keep within their estimates.

You will also be interested to know that we have for some years in this Bank been carefully studying costs, and more particularly the cost of operating each customer's account, and we are now able to tell fairly accurately what profit, if any, there is in conducting an account. We know what it costs us per entry, for every entry means an item of expense just as every bit of labor is an item of expense in a manufacturing plant. This has enabled us to stop many leakages and is entirely due to our taking a leaf out of the Cost Accountant's book and applying intelligent analysis to the cost of doing business in the Bank. We have found that if we are able to show a customer this his account is carried at little or no profit, it is very rarely he is not willing to adjust matters on a reasonable basis.

Farm Loans

As a second example for review, take a prairie farmer and if satisfied as to his honesty, industry, knowledge of agriculture, and capacity, we can consider his statement. He is a producer, and we can only lend to him on his prospects of success. If it

is essential in a manufacturing business for the banker to know his man, it is quite as much so with a farmer borrower. While the quality of his land is important his ability is even more so, as really capable farmers do not settle on poor land. Our experience is that the size of the farm depends very largely on the amount which can be handled by the farmer and his family with a minimum of paid help if a decent ratio of profit to capital investment is to be shown. A large operation depending to a greater extent on hired help has poor prospects of success, as the many failures in bonanza farms in the west goes to prove.

In preparing a statement of the farmer's affairs, care must be taken to include in the liquid assets only cattle and grain which are for sale,—work horses, dairy cows, and implements must be excluded. To the floating debts must be added the proposed advance to give the total amount to be paid from the season's operations, and then an estimate of the probable income of the farm will be available from the information. If he has ten dairy cows, the cream cheques will probably more than keep the household. The amount of land seeded to hay, oats and barley should provide a safe margin for sale over his needs. The natural increase in the live stock will create additional assets. The fact that he has two sons and a daughter well grown disposes of the cost of hired help at harvest time. In a case of unlooked for disaster by frost, rust or insects, make sure there is a marketable equity and sufficient working stock to enable him to raise enough money to pay off the bank loan.

The list of points calling for review must appear formidable for the consideration of a simple bank credit and possibly some of the conditions suggested are almost impossible in a practical world of business. There is no getting away from the fact that credits that are ideal in every particular are extremely rare, and here is where the banker must use judgment. He knows what ought to be but he has to take the conditions as they are, and, other things being satisfactory, a shortage of working capital or some other unfavorable feature will not necessarily indicate that the business will not be a success. If the integrity and industry of the applicant are above criticism and his reputation for making money is good, the gain in his business will often overtake the weakness within a reasonable time, and the banker will be well-advised to look on his application with favor.

Important Features

It would, of course, be possible to elaborate at considerable length, on the various items that usually enter into the statement of a manufacturing concern or a man engaged in a commercial business, but there are two on which the fullest information is essential,—first, the inventory, and second, the receivables. These are both points on which the Cost Accountant can be of the greatest possible value to the manufacturer in preparing a true statement of his position.

In former days a good many inventories were taken at the selling price, and an arbitrary figure deducted to arrive at what the manufacturer considered his cost, and this often caused him to live in a fool's paradise until one day he awoke to find that his goods were costing him a great deal more than his statement showed. It is not good practice to use market value unless it is lower than cost as by so doing a paper profit is often shown.

The slump in inventories which began in 1920 was not realized by many of our business men for months and in some cases years afterwards. Those who successfully coped with the situation took their losses early and wrote down their stocks, got rid of them, and replaced them with new goods at lower prices, for after all, success in business depends upon the exchange of goods and no money is made by retaining them in stock no matter what value may be placed upon them.

I have tried to emphasize the necessity for relying upon judgment rather than figures in a bank manager, and I am going to take the liberty of impressing that, too, upon you gentlemen who are Cost Accountants. There is a strong and natural tendency for a man dealing always with figures *to regard them as the end and object of his efforts.* Unless he is watchful the Cost Acountant is liable to become immersed in technicalities. He is so anxious to make his figures accurate that he loses sight of the actual condition of the business. The system should be made for the business and not the business for the system.

In one case where a company had installed an elaborate cost system the banker asked the manager how it was working, and was told, "Well, we used to pay six per cent. dividends, but now we have such a wonderful system of cost accounting that it absorbs all the profits and there is nothing left for dividends." There may be a grain of truth in this complaint. The Cost Accountant should have a broad grasp of all the phases of business activity and be able to size up the situation and install a system proportionate to the needs of the business. It is easy enough to enlarge it to fit its growth without adding much to its cost.

As bankers we feel satisfied that there is the greatest necessity for proper systems of Cost Accounting and Budgeting if concerns are to survive under present day conditions. The days when the manufacturer could make money without knowing the costs of his business operations have gone. The success of our friends across the line in the United States is largely due to their adoption of up-to-date methods. Over there, there is a great mobility in

ideas, in fashions, in transportation, in adapting old processes to new conditions, and while paying higher wages they have increased the amount produced. In the last twelve years the population of the United States has only increased some 16%, whereas its productivity has been augmented by something like 30/35%. To mention only one item, their railways carry 22% more traffic with about the same number of men. There has been a great increase in the number of students in technical institutes. There were over 600 industrial research laboratories established in the last twelve years. The number of trained technical men employed in their industrial plants is larger than in any other nation and this has necessitated the employment of trained industrial accountants, and to this educational advance is due in no small measure their amazing prosperity and their success in selling their goods in the foreign markets of the world.

While we do not wish to be slavish imitators, there is no reason why we should not adopt the best practices of every nation, and on this question there can be no argument as to the increasing value of the expert accountant in every line of business, and the desirability of Cost Accounting from the Banker's point of view.

A New Electrical Production Control System

LOTHAR EDERER

R. J. Ederer Company, Chicago

FOR many years the necessity for centralized planning and control of manufacturing plants has been recognized by progressive managers and engineers.

The old plan of dumping orders into a plant regardless of conditions is parallel to dumping material into a funnel and trusting to luck that each of the various sized objects will come out the little end without jamming and in logical sequence. It was sufficient, under that plan, to know that the object was of such description that it would go through if given the chance, but the entire problem of taking it through from process to process was left to the foreman, or superintendent.

In most plants work must pass through a number of departments, each with its respective foreman, responsibility for producing the job in its entirety being divided. This is usually covered by providing a stock "chaser" whose duty is to follow parts through from machine to machine and from department to department. The stock chasers are not planners. Their work starts when an order is *overdue,* or when a customer asks for special service or complains of lack of service. The work of the stock chaser is, therefore, a follow-up process of incompleted work, and is more of a deterrent to shop efficiency than a necessary part of a constructive planning scheme. It is grounded on the old principle of temporarily satisfying customers by putting pressure on the items which are being complained about most, in other words, giving best service to the customers who "holler" the loudest. In many instances these customers are of second rank, still, more important work will be crowded aside to make possible the early delivery of their job. Ultimately, of course, the job which has been set aside in this manner becomes overdue and it in turn requires chasing.

Chasing v. Planning

"Chasing" places a shop on a hand to mouth basis. It costs money in time wasted, materials thrown out of line, increased machine set up and general loss of efficiency, and in the final analysis does not satisfy the customer because it all started *after* the job was overdue.

The modern way is to *plan* what *must* be done against what can be done and to direct all work according to a sound, workable production program, so that each and every job in the plant is followed constructively on the basis of *planned delivery,* not upon customer complaints.

To plan requires knowledge of the raw and finished material sources, potential business, orders on hand, information as to the shop equipment, machine capacities, a positive knowledge of material on hand, and a definite means of visualizing and executing the plan and proposed flow of material through the plant.

Such planning must be done centrally when all other information, machine data and means of control are available. No foreman or department head can plan constructively, even for his own department, because he has no means of knowing what is coming to him nor the relative importance of orders when they do come. Even if he were able to plan to a degree the program would be immediately upset by a stock chaser, or by lack of proper material with which to proceed.

Many a first rate foreman has been driven to distraction through the constant tearing down process which the old type management unintentionally practices through lack of planning. Eventually he gives up all hope of controlling work within his department and assumes the attitude of taking things as they come, directing his energies mainly to keep-

ing his men busy regardless of whether they are on the most important jobs or not.

Planning Production

Under the planning form of management definite plans are laid down in advance by the planning department and the results to be obtained can be foreseen weeks ahead, in many cases.

To plan a production program, however, is absurd unless some means is provided for making the plan possible. It is essential that the work be carried on according to the plan and that a job be not only started, but *completed* according to schedule. This involves the establishment of a means, first: for notifying the foreman what jobs are to be done and the sequence in which they are to be run, and second: for checking the progress of work as it is done.

The latter function is now greatly simplified through the medium of a new system we have developed and are using in our Chicago plant known as the Temporator control of manufacturing elements —an electrical system which provides information as to the start, intermediate progress, and finish of all jobs in a plant, transmits this information directly to the central control station and makes possible not only a continuous and up to the minute record of shop progress, but also provides a centralized time keeping plan which makes for absolute accuracy and requires a minimum of clerical help for its operation.

Control Equipment

The equipment consists of a series of sub-stations which are placed at convenient points throughout a plant, and connected electrically to a central station in such a manner that information is sent directly from the sub-stations and recorded at the central station.

The medium for sending information is a dial similar to that used in connection with automatic telephone equipment. It is simple to operate and fool proof. Experience has shown that persons not able to read and write dial correctly and quickly with little practice.

All of the sub-station units are equipped with a visual arrangement whereby the information as dialed appears in a window at the top of the unit so the person dialing may be sure all figures are correct.

The same sub-station unit and visual serves at the central station as the medium from which information is recorded as received.

The plan of operation is as follows:

When a machine operator completes a job he goes to the nearest Temporator sub-station and signals for a line by means of a button on the unit. This signal appears at the central station where the operator plugs in on the line and the connection is indicated at the sub-station by a small red light which immediately notifies the workman that the dialing may start. The workman dials in his number, order number, operation number, or whatever information is required in the particular case covering the job.

The switchboard operator takes the information from the unit before her, notes it on a "call slip" designed for the purpose and clears the machine by tripping a clearing switch. The machine operator at once dials in the data covering the next job which is *starting* and this is likewise taken off and the machine cleared.

The central station operator stamps the time on the two slips and puts them at the front of a pocket corresponding to the machine numbers given. This represents one complete cycle. The operation as a whole requires about one minute.

The machine operator handles no time tickets and does no writing.

The time accumulation slips are all made out by one central station operator, hence they are uniformly written up and properly segregated. There is no necessity for hourly or daily collection of slips and no chance of lost information in transit.

Progress Reports

Complete information on progress, correct to the minute, is always available at the central station and the job upon which each machine is working, the time it started, the number of jobs completed for the day, and machine shut down or "blocks" can be told at a glance from the schedule rack.

If the planning is visualized on a "load" or a "flow" board as is customary in modern plants the progress of work can be indicated as often as desired during the day, thus making possible an absolute check on progress.

Visual Control

The usefulness of the machine rack as a visual control has also been greatly augmented by an ingenious use of colors in connection with "call" slips. The start of a job is written up on a blue slip, the completion on a white slip and "blocks" on a red slip. A glance at the rack indicates immediately what machines are "blocked" as a red slip will appear at the front of the machine pocket. An inspection of the red slip tells the cause of the block and at what time it occurred. This feature is of vital importance to the Production Man as his object is always to keep the equipment running full time if possible.

Used for Maintenance Requirements

In this connection the Temporator system assumes another role of importance, being designed to handle service and machine maintenance requirements, as well as time, accumulation, order and mechanic progress.

For this purpose a dial is placed on each machine so that the operator can dial in by number to the central station for any desired service.

For example, there may be a call for a foreman or forelady, a call for inspector, one for setup man, one for repair man, etc. Any service that is covered by a particular party, or parties may be listed and assigned a call number. When a particular type of service is required, the machine operator, without leaving the machine, dials the number of the service wanted. The call comes direct to the central station board where the type of service desired and the number of the machine upon which the given service is needed is indicated. The central station operator immediately flashes the service number in an electrically lighted overhead visual signal, located on the floor where the service is desired. The person handling the service corresponding to the number called, goes to the nearest sub-station and dials his service number. The central station operator upon receiving the signal dials back the number or numbers of the machines, or work stations, requiring service. The service man notes these numbers down and goes to each machine in order, rendering the service needed.

Aids Continuous Production

This means more continuous operation of machines, more constructive service for operators, less confusion and delays in handling service, and improved all around efficiency.

It is possible under this plan for the machine operator to dial for the foreman several minutes before a job runs out, and for the foreman to dispatch the tools, blueprints and materials as well as the order for the next job directly to the machine so that there is no delay between jobs. It is also possible for the foreman, inspector, setup man, or other supervising head to be at the vital points where their help is needed without necessitating the operators shutting down their machines to look for their assistance.

The necessity for workers leaving their machines, or work stations is absolutely eliminated, as all materials and information are brought to them.

This is all easily accomplished through a simple dialing in at the machine by the operator and the taking of calls from the nearest Temporator substation by the party whose number appears in the overhead visual and who handles the service required.

It may appear at first thought to be beneath the dignity of a foreman or inspector to be on call from the machine operators, but such is not at all the case.

THE PRIMARY LAW OF EFFICIENT PRODUCTION IS TO KEEP MACHINES GOING and machines cannot be kept going if the operators are allowed to leave their machines to look up instructions, orders, blueprints, tools, or other information. The answer then is to provide a type of electrical service that eliminates chasing and confusion and keeps operators at their machines and machines at work.

Analyzing Service Calls

Another feature of the service rendered through the Temporator equipment is that all service calls pass through the central station, and a record can be maintained at this station of all such calls.

This means that the nature of the calls can be analyzed by the management as to the number of calls received per service, the machines calling for such service, and the number of calls per machine. This information has been found important in tracing weak points in both machines and in service rendered, and leads to an adjustment of the service work giving a first class idea of the sources of trouble.

Interchangeable Units

The equipment is designed to withstand rough usage and to require an absolute minimum of mechanical service. The dials and sub-station units are standard equipment. The mechanical selectors in the sub-station are of simple and rugged construction and are replaceable as units. There are twelve of these units in the sub-station and each unit can be removed by simply lifting it from its place. Electrical contacts are all of the jack type so there is no disconnecting of wires in removing the selectors from their places.

Electrical power is furnished by approved battery or motor generator installation specially designed for the purpose.

The standard sub-station is compactly housed in a metal case 11 inches by 18 inches by 8 inches high. The central station units are duplicates of the sub-stations and are used in connection with a regulation switchboard desk at which the operator works.

One operator can handle 800 to 2,000 calls per day of nine hours without difficulty, and it is not necessary that such operator be other than would be required for ordinary telephone switchboard work.

Adaptability

Covering as it does, two of the most vital, as well as the most baffling features of plant control, the Temporator system is, we believe, one which should be attractive to production men everywhere.

In those industries which are already operating under some system of production control, the system will apply because of its many features, eliminating clerical help and obviating errors. In those industries which are not properly controlled to-day it should find a ready application, because of the enormous savings in time and labor effected.

To-day originality depends upon the resources from which we are able to adapt. The Temporator system is a combination of adaptability and resourcefulness which will carry the manufacturer further in his cost finding and production control than originality. It assures in advance accurate information on every conceivable manufacturing situation that may arise.

(By permission of the Society of Industrial Engineers.)

DEPRECIATION

Its Relation and Application to Costs

By THE LATE M. J. SMITH

of the Goodyear Tire and Rubber Co. of Canada, Ltd.

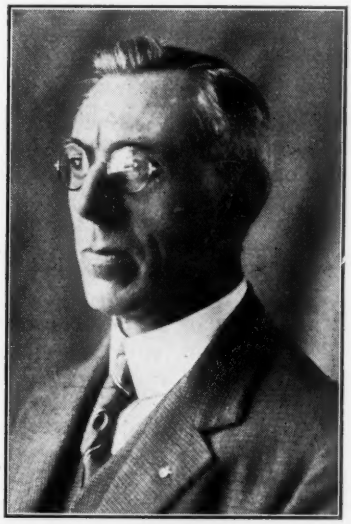
[Paper read at a meeting of the Toronto Chapter]

Definition—The Act of Lessening the Value or Worth of; Fall in Value.

THIS lessening of value is caused by age and deterioration, wear and tear, obsolescence and other factors.

Depreciation attempts to measure the effect of time and production on physical properties and equipment and to record the results in dollars and cents. This computation cannot be exact because the elements affecting deterioration are many, and their relative importance difficult to determine.

One fact is certain—That while depreciation may to a certain extend be postponed, it cannot be ultimately avoided. All plant and equipment must suffer from and finally succumb to depreciation.



M. J. SMITH

The business man who does not charge depreciation at all, is making no provision for the enevitable day when his property must be scrapped. His supposed profits may be, in fact, a distribution of capital.

The one who waits to the end of the year to determine his depreciation according to the size of his profits, may discover he has no profits, since he has sold his product based on an inaccurate cost, a cost which excluded such a necessary expense of manufacture as depreciation.

Everything going through a factory should bear its proportional cost of depreciation charged into current costs.

The need of setting up a "Reserve for Depreciation," as it is commonly termed, arises from the fact that plant and equipment become obsolete before they are worn out from use. Some machines are seldom used and actually depreciate through neglect.

Obsolescence is often one of the most important factors affecting the useful life of machinery and equipment, and is not always given sufficient consideration when setting up rates or percentages to be charged to costs.

Show an up-to-date business man a new piece of equipment that will give him a better and cheaper service, and he will scrap his present equipment.

Machinery and equipment designed and used exclusively for certain industries is liable to become obsolete much sooner than what may be termed "Standard" equipment, which is not exclusively designed for one industry.

Machinery is more often replaced because there arrives on the market something that will do the job better, than because it has worn out.

One authority states:—

> "In selecting the proper basis for an annual charge to revenue for depreciation of industrial plant, the evidence is irresistible that expiration of time is the dominating factor. It is astonishing how rarely the rate of destruction of value, due to actual use, overtakes the rate of destruction due to constant and inevitable decay and liability to obsolesence."

When determining the useful life and rate of depreciation of machinery and equipment, be sure to give the factor of obsolescence due consideration and allowance.

It is safe to say that the underlying principles of depreciation are more exact and may be more thoroughly understood than those of many other factors entering into Costs, and that these principles are well defined and agreed upon.

While depreciation may be described as complex rather than simple, any difficulty arising in computing it does not warrant its omission.

We are probably all in agreement that depreciation exists, and therefore must be accounted for in some way. In all likelihood we will be unanimous in agreeing that it is a necessary part of cost, but it is doubtful if we all would use the same rates or adopt the same method of application. It is with regard to these two points that so many accountants and engineers agree to disagree.

FIRST, as to rates—There is seldom sufficient study made as to the correct rate to use. Rule of thumb typical rates are used such as 2 or 3 per cent. for buildings, 5 or 10 per cent. for machinery, 20 per cent. for trucks. etc.

The best judgment regarding depreciation would be only an approximation, frequently belied by subsequent experience, but there is considerable difference between guessing and estimating—A guess cannot be justified. An estimate of depreciation must endeavor to take in all the factors governing a given situation, to weigh their importance, to give heed to past experience, to differentiate between various kinds of machinery, buildings, etc., and apply depreciation with reference to a particular asset or group of assets.

Auditors tell us it is not unusual to find assets grouped under general captions, such as Buildings, Machinery and Equipment.

The "Buildings" may be constructed of wood, concrete, steel or brick; they may have been designed for heavy use or light; they may include fencing or wood fixtures, drainage or lighting systems.

The term "Machinery" may include electric generators, steam engines, motors, hydraulic presses, lathes, planers, boring or milling machines, both heavy and light machines and even light tools.

"Equipment" may vary from a locomotive crane to a gasoline pump, from a boiler to a fire alarm system.

While the actual use of all these assets may vary from say three to thirty years, yet all will be found bearing the same rate of depreciation.

Such being the case, the first essential for proper recording of depreciation in an accurate classification of property. Specific items and units of property must be enumerated and classified by kind, group and department.

If the proper classification has been kept, then the experience gained is a real guide in the establishment of rates to be used for the future.

The experience of any one firm is limited and may be modified by the experience of the industry.

It is gradually becoming a practice in the States for trade groups to have made a scientific study of depreciation, and by these means establish tables of depreciation which may be called standard or normal for that particular trade group. This is a step in the right direction, although it is expected that adjustments of those normal rates will be made to suit the individual requirements.

In examining causes of depreciation or decreasing value, they may be divided into two groups or classes:—

(1) PHYSICAL, those which can be foreseen and planned for.
   (a) Wear and tear consequent upon use.
   (b) Deterioration due to the passage of time and exposure to the elements.

(2) FUNCTIONAL, those which are uncontrollable and usually cannot be foreseen.
   (a) Obsolescence.
   (b) Inadequacy.
   (c) Accident (usually covered by insurance).

Those in Class I are certainties, are inevitable, and must be provided for out of revenue. They must be charged to Cost of Production just as much as labor or supplies.

Those in Class 2 must also be provided for, and it is common practice to set a rate high enough to take care of these contingencies.

Some accountants believe that while these should be provided for, they cannot be considered as a Cost of Production, and since they cannot be foreseen and guarded against in any definite way, they should be classed as other contingencies and provided for by a true reserve, a reservation of profits, a surplus appropriated for contingencies.

If this distinction is made the balance sheet may exhibit two distinct classes of provisions for loss. The balance of one account will appear on the left side of the balance sheet as a deduction from the cost of the assets, while the Reserve Account will be shown as an item of appropriated surplus on the right.

When setting rates or rather considering how much shall be charged off, with the elimination of the functional or uncontrollable causes we must consider:—

1. The original value.
2. The scrap value.
3. The ordinary life.

The original value is known—the scrap value may be foretold with a fair degree of accuracy. The ordinary life can be readily ascertained if our records have been adequately and correctly kept in the past—or the standard or normal rate may be used such as commonly used by the particular industry or group to which we belong, if such is in existence.

If we have no records and no past experience then the life of the asset is difficult to determine and the estimate of the engineer rather than the accountant should be used. Consideration would have to be given to the character of the asset—its use—sur-

roundings—the climate—the carefulness of its installation, the skill of employees, and possibly the character of the plant management.

With regard to the proper rate of depreciation, there is even in well managed concerns of a similar class, a wide divergence of practice. Depreciation rates are largely matters of opinion, judgment and experience.

One authority says:—"An engine properly set and under the exclusive charge of a competent and careful engineer will have a life of twenty years. The average life of a boiler is ten years. If the engineer is not a careful and competent one, the life will be considerably less. Many cases have been known where in less than five years they have been, through carelessness, rendered entirely useless and consequently worthless."

Rates, however, have to be set and while they should be large enough to be safe, they should not be larger than necessary to protect the welfare of the business, or by increasing factory costs, they may restrict the sales department in their battle for trade.

In attempting to start a discussion on the subject, I am not going to suggest what rates should be used, and if I have or do mention any rate it is only for the purpose of illustration.

We will now turn to methods of which there are many, such as:—

1. The straight line method.
2. The reducing balance method.
3. The appraisal method.
4. The working hours method.
5. The piece or unit method.
6. The annuity method.
7. The sinking fund method.

(1) The best known is the Straight Line Method. The total amount to be charged off is distributed equally over each account period on the theory that the use of the machine benefits one period no more and no less than any other period. The object, which is generally raised to this method is that just after a machine is purchased, it requires little or no expenditure for repairs and maintenance, while in later years there will be considerable expense in the way of upkeep. It certainly has the advantage of simplicity.

(2) The Reducing Balance Method has been devised to meet the objections to the Straight Line Method. This method involves the use of logarithms; but tables can be procured. The burden of depreciation is made much heavier in the earlier years of a machine's life than in later years, with the expectation that the increased burden in repairs and maintenance in the later years will tend to make total annual burdens substantially equal.

A substitute for this plan which has been found to give good results is as follows:—Add up the number of years of anticipated life using this figure as a denominator. For instance, a machine with a suggested life of 6 years—By adding the years of 1 plus 2 plus 3 plus 4 plus 5 plus 6, we have a total of 21. The first year we charge 6-21, the second 5-21, and so on, till the last or sixth year we have 1-21. The yearly charge has been gradually reduced.

(3) The Appraisal Method involves a revolution or appraisal at the end of very accounting period, and is seldom used on account of its great expense, and does not result in spreading the depreciation scientifically over the various accounting periods.

(4) The Working Hours Method is estimating the life of the asset in terms of working hours rather than years or months. The total amount to be charged off must be divided by the estimated life in hours and a rate per hour obtained.

This rate is then multiplied by the total number of hours a machine has been running during an accounting period, and the result equals the depreciation charged for that period.

The best feature of this plan is that the depreciation charge exactly agrees with the use made of the machine, it being assumed the machine depreciates in proportion to its use.

It is open to the same objection as the Straight Line Method, viz:—That no provision is made for heavy repair and maintenance cost in the later years of life.

If it were possible to forecast repair and maintenance cost accurately and add this amount to the amount to be written off, the sum of the two divided by the number of working hours to arrive at an hourly rate, this would certainly be an attractive plan, but it is difficult if not impossible to make an accurate forecast of the amount to be spent for repairs and maintenance.

(5) The Piece or Unit Method resembles the Working Hour Method in that it bases depreciation upon the machine's output.

This method is employed in amortizing wasting assets such as coal and ore mines, a definite charge being added to each ton mined and sold.

(6) The Annuity Method is based upon the theory that the cost of production should include not only repairs, maintenance and depreciation, but also interest on capital invested. This method has not the approval of the best authorities. The assumption that interest on capital should be included in the cost of production is not universally accepted and is a contentious subject in itself.

(7) The Sinking Fund Method is so called because of its use in connection with a sinking fund.

The characteristic of a sinking fund is that it grows in value out of proportion to the annual in-

stallments owing to the accrual of compound interest. Therefore the annual installments to a sinking fund for depreciation need not be so large as the annual provision under the Straight Line Method. It has the same objection as has been noted concerning the Straight Line and Working Hour Method, that is, that the burden becomes heavier as the asset approaches the end of its useful life.

There are other methods and combinations of methods, but sufficient have been named to start a discussion.

The question will likely be asked—should depreciation be based on cost or replacement value?

Depreciation for cost purposes is not concerned with resale or replacement value, but aims to recover the cost of assets less any salvage.

The fact that the plant cannot be replaced at the same cost, but only at much more, has nothing to do with the cost of its product, but only with the cost of future product turned out by subsequent plants.

As the product goes through the factory, it should be burdened with expired not anticipated costs.

In conclusion the following points may be noted:—

1. Charge depreciation so that profits may be real and not, in fact, a distribution of capital.
2. That costs may be complete. Charge depreciation against current operations.
3. Factory co-operation and skilled workmen will minimize unjustified depreciation.
4. Do not forget obsolescence. It is often the determining factor.
5. Avoid rule of thumb rates. Frequent inspection, adaquate records, your own experience checked by that of your industry is the best guide.
6. Record depreciation with reference to specific items or units of property. Make use of a plant ledger.

Factory Management Wastes

By J. F. WHITEFORD, M.A.S.M.E. (England)

[*Report of Lecture before the Birmingham Branch of the Institute of Industrial Administration.*]

THE curse of the civilized world to-day is not Bolshevism, nor Capitalism: it is not labour unions, and it is not employers' federations. The curse of mankind to-day is WASTE—PREVENTABLE WASTE.

Industrial Wastes exist to-day because individuals refuse to accept the responsibilities attending their individual acts. If the waste in industry is eliminated, the world, the community and the individual will benefit. So in discussing the question we have first to allocate the responsibility.

Now in speaking of waste I do not mean waste of material, because that form of waste is visible. You can see it. You have only to go to the scrap heap and see that material has been wasted. When I speak of WASTE, I refer to misapplied and misdirected energy. That is something which you cannot see, and that is the reason why there is so much of it. Wasted material requires no imagination to appreciate, but it is entirely different with misdirected energy.

Classes of Industrial Waste

Industrial waste existing to-day can be divided into four classes: "Faulty Management," "Intentional Restriction of Output," the waste resulting from 'Disabilities," and the waste which comes from "Idleness."

Of the total waste in industry to-day there is fully 65 per cent., for which the management is entirely responsible. Labour is probably responsible for 25 per cent., and the remaining 10 per cent. you can attribute to the wasteful methods of the community at large.

It is a serious matter when the management of industry is responsible for 65 per cent. of the preventable waste, which can be eliminated without reference to the labour factor.

These wastes, in the order of their importance, are:—

(1) Imperfect Design.
(2) Inadequate Production Control.
(3) Ineffective Co-ordination of the Sales and Production Sections.
(4) Inaccurate Costs and Statistics.
(5) Improper Working Conditions.
(6) Incompetent Personnel.

Imperfect Design of Product

Now to sketch briefly these six classes beginning with the question of design. The designers of a product concern themselves largely, if not entirely, with the operation of that product. They do not concern themselves with the production of that product. The net result is that the producing side of the business has to make up for all the shortcomings of the designer.

Take, for example, a machine which has not been properly designed and has too many parts. Only recently I heard of a machine where 500 working parts had been eliminated. The machinery, the organization, the equipment and everything con-

nected wtih the production of those 500 parts were unnecessary. Every unnecessary part only serves to increase the volume of waste.

Probably the best known example is in the motor industry. Some years ago I discussed this question with a leading motor car manufacturer. He was producing 26 different designs of cars and I suggested that the number was too many. He said: "I must serve my customers. They want different types of cars and I must meet their wishes or go out of business." I said: "I do not agree with you, although at present you make a car largely to the specifications of your customers. But do they know the correct length of wheel base, the correct diameter of the cylinders and the length of stroke which suit the best type of car, and are they in a better position to specify the various details of a car than a motor car manufacturer? As the result of your experience are you not in a better position to tell them what they want?"

He did not agree with me, but in the meantime a genius developed in the motor car industry who forced the issue. This man had the tenacity and the common sense to stick to a few fundamental principles in the manufacturing of motor cars. The net result is that he is manufacturing 65 per cent. of all the motor cars that are made in the world.

This man was not prepared to make as many types of cars as there were customers who wanted some modification. He adjusted the design to suit methods of manufacture, and to-day he is practically dominating the motor car industry of the world. And there is no good reason why the Ford plant could not have been in Birmingham instead of Detroit.

Now to take an illustration apart from motor cars. I know of one factory which manufactured containers for its products. There was a great waste of material. Seeing the material waste the management could realize there was waste to be eliminated, but they did not realize that they were making in all 1,400 different sizes of containers when 300 were sufficient.

When this form of waste was realized and eliminated they increased the capacity of the factory about 50 per cent. Being machine production they could get very much longer runs, fewer machine changes, and the net gain, of course, was tremendous. In those cases we can attribute all of the waste to design.

Inadequate Production Control

Next the question of production control. When I remarked to a managing director that he did not have his factory under control, he said: "Everybody does what I tell them to do. I can get anything done I want to in the factory; I know what is going on. What do you mean by telling me my factory is not under control?" I asked: "How long does it take? What is the minimum of time from the raw material coming into the factory to when it comes out as the finished product, and what is the actual time?" He did not know, but within a few months he had increased the output by planning ahead, by arranging the work of the different departments so that all the work was co-related. He had increased the output by 65 or 70 per cent.

The product of the factory concerns all departments, and it is necessary to keep the work in balance. How do you suppose the railways would carry on if they worked similarly to most of our factories? Suppose you go down to New Street Station. You want to take a train for London. At present you get in the train and are taken to London in two hours.

Now suppose they operated the railways as they do so many of our businesses. You would go down to New Street. You would want to know when the next train would leave for London. No one could tell you. You hunt up the stationmaster and ask him and he tells you "Put your name on the blackboard and when we have enough people to make up a train we will run one." So you put your name on the blackboard, some others do the same, and you figure out how long before there will be enough down to a get a train full. Then you find after a long while perhaps that they have got enough for a train. They bring up the train and it is loaded up ready to start.

Then you find that there is no locomotive. They go to look for a locomotive and when they have got it they find that someone in the purchasing department has bought the wrong kind of coal, because they could get it cheap. Then they have to take the engine back to the shop and put in new furnace bars. You would then perhaps get started, but you would soon stop because somebody had forgotten to put water in the troughs, and you would wait until the pump got going.

Then you would find you would have to change at Rugby, and by the time you arrived there the train for London had gone on because the mayor or some other personage was in a hurry and he had to have precedence. And so on. You would have to wait hours to get another train.

I could multiply these illustrations. I could apply to the operations of the railway those of the average factory. You would get to London finally, of course, but you would not get there in two hours. You would not get to London in ten times two hours as at present.

The railway has a plan. If you want to take a journey you get an A.B.C. or a Bradshaw. You know exactly when you are going, when you will arrive at your prospective destination. It is so dependable that you make appointments accordingly.

There is no reason why factories should not be run on the same plan. It is incumbent on the management to keep control. Management must be al-

ways looking ahead, and it means from 35 to 150 per cent. increase in the output of the factory.

Ineffective Co-ordination of Sales and Production

Now the question of co-ordinating the sales and the production. One of the biggest troubles of to-day is that the sales department controls the factory. I could tell of instances where the salesmen actually run the factory. They go to the factory and tell the foreman what to do. They tell him that they are in a hurry for this or that particular order, and compel him to drop this and to change about.

The great trouble is that the selling and the productive side of the business are not running together. The head salesman of a factory came to me one day and said: "The factory has got into an awful state. We promised our customers a supply of our new lines, but to-day there is not a single one of them in stock, and there does not seem a chance of getting them into stock." I remarked: "You cannot get what they require in the old lines. Then how do you expect you can get the 25 new lines which you have put on in addition, and which must mean so much loss in output." I said to him a few days later: "If you make certain changes in the design you can figure on a 30 per cent. increase in output, for then the factory can work to better advantage."

The suggested changes were made and the output of the two articles was 29¾ tons instead of 17 tons, and the customers were just as well satisfied; in fact they were better satisfied because they got the quantities they ordered promptly. And it only meant a very slight alteration which should not have been necessary, because in making the design they never considered the machinery of production.

Inaccurate Costs and Statistics

Then the question of costs and statistics. The chairman of a company complained of the works manager, in fact blamed him because the company was losing money. And this in spite of the fact that the works manager had secured a substantial increase in the output of the factory.

That is a common fault of the chairmen of companies. If anything is wrong they think only of changing the work's management. Of course, if they change the management *far enough up* it would often serve as a corrective measure.

In this instance it was found, when the system of costing was investigated, that the bulk of the sales was on a line which was sold at less than the cost of manufacture. The sales of this particular article were increasing, and for every lot sold the firm was losing money. They were offering an inducement to the works manager to get more and more production, and if it was increased up to a certain point the length of time the business could remain solvent was purely a problem of arithmetic.

The works management was being censured when the fault was higher up. *As a matter of fact there are less than five per cent. of the manufacturers who know what their products are costing them.*

In another firm the managing director had it figured out that the cost of one of his products was a minus quantity. They had put in labour, material and establishment charges, and yet, according to the cost figures, the firm could give the article away and make 4d. a pound profit on it.

The fault with this director was that his costing was wrong in principle. When it comes to a question of costs there are so many people who think that they can ignore principles with safety if the calculations are carried out to enough decimal places.

Now the question of statistics. How many manufacturers know exactly what is going on in their businesses? If you want statistics you have got to know what is to be done, when it is to be done, and how it is to be done. Then you have to know what was done, when it was done, and how it was done. My experience is that there are very few manufacturers who are in a position to answer those three questions definitely, but it is the only way you can find out whether waste exists or not.

If you do not know what can be done, if you do not know the exact length of time, if you do not know how it is going to be done, and when it is going to be done, you are not in a position to know just how much waste exists.

Improper Working Conditions

Now as to improper working conditions. Air and light, two of the cheapest things in the world, are not used sufficiently in factories, although they have a very important effect on the volume of work turned out. You can probably get anywhere from ten to twenty per cent. increase in output by *improving the lighting conditions* at a cost not exceeding one-half of one per cent. of the expenses.

They used to build factories without any consideration of what was going to be done in them. Take an old factory, then a newer factory, and see the difference in the wall area that is in windows. The old factories used to be built with thirty to thirty-five per cent. of glass. It should not be any less than 80 per cent.

Then there is the question of heating and ventilation. If people are going to work well they have to be comfortable; you must see that they can get about; they have to have things arranged in a convenient manner.

Very few factories are built that provide any means of getting material in or out of the work rooms. It may seem strange, in view of the fact that manufacture consists of changing the form or

the shape of some material or other. But at the same time they never study how to get it in or how to get it out.

I can tell you a case of a foundry, to show how important the question of handling material is. They handled 168 tons of material for one ton of castings. Although that quantity had to be handled in order to get one ton of castings, there was no provision made for moving it except by hand.

I can tell you another case where five years ago there were 550 men engaged in handling the material in and about a factory, and to-day the whole of that work is done with 55 men and 25 machines.

Now these are records of waste. This entire discussion is a question of waste, and the costs are being added to the cost of the product. All these are wastes for which the management is entirely responsible. It is no use blaming the labour unions or the men for other wastes so long as these wastes exist.

Incompetent Personnel

The last item—"Incompetent personnel." In how many organizations is full consideration given to the selection of people? Investigation shows that there are about 75 per cent. of people in the factory on the wrong jobs, and you can get anywhere from 40 to 50 per cent. increase in output if you put them on the jobs for which they are fitted. The responsibility is with the management when we come to examine it.

The responsibilities of the management are very extensive. The management select and assign work. What are the requirements for that particular job? How many managements know them? They are beginning to consider this question of selection now because of the tremendous wastes involved by refusing to pay attention to it formerly.

This involves not only the requirements for the job, but it involves the study of the methods of doing the work, and when we get down to the study of the methods of doing the work we find it is necessary to educate and to train the people to do the work along these lines.

The study may disclose that a lot of managers and executives are on the wrong jobs, so that you have to start in at the top and not at the bottom.

The study of the elimination of wastes has extensive ramifications. In the management of an industrial concern the advantages resulting from organization are probably about 35 per cent. The advantages resulting from technical knowledge may be valued at 20 per cent.; the great gain is in utilization of knowledge, which is the other 45 per cent. We used to be told that knowledge was power. Knowledge is not power. IT IS THE USE OF KNOWLEDGE that really matters.

You can have all the records. You can know exactly—you can have the percentage of waste carried out to several decimal places, and all listed and tabulated, but these records will not in themselves eliminate waste.

Technical knowledge does not in itself eliminate waste, and organization in itself does not eliminate waste. As a matter of fact over-organization is more of a hindrance than under-organization, for the art of management is not equally developed with that of the science of management.

The Art of Management

The science of management has been developed until we know what are the causes of waste and the relative values, but these wastes cannot be eliminated until the art of management has been developed. Now that is the problem of management. The art of management is the thing that is in need of attention, and it is the art of managing people.

If you have the records, the success of the manager is in his ability to get the organization to work, to get these wastes eliminated. There is no best plan. You do not "manage" material. You do not "manage" the buildings and the equipment. You do not "manage" anything that is incapable of self-determined action. You "manage" people only.

The cure, the means for eliminating waste, is in the better education, the better training of the people concerned in order that they may make full utilization of their time, of their energy. The best plan, like the best manager, is the one that works most effectively.

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The Committee on Elimination of Waste in Industry appointed by Herbert Hoover in 1921 reported the waste for which management and labor were responsible in six of the leading American industries as follows:—Metal Trades, 25.8 per cent.; Textile, 29.4 per cent.; Boots and Shoes, 35.1 per cent.; Building Construction, 45.6 per cent.; Printing, 52.6 per cent.; Men's Clothing, 58.8 per cent. How does Canada stand?

Simplification is the "Mother of Profits." Have you ever figured out how much more money you would make if you cut out all your unprofitable and all your little profit bearing lines and concentrated on your "Money Makers." Nearly every industry has some lines which yield the maximum profit. Push these and let the "Other Fellow" have the unprofitable business.

One feature of modern industry which differentiates the industrial methods of to-day from those of the past is "Progressive Assembly." Many manufacturers have not found this out as yet.

The Value of Engineering Service to Industry

By FREDERICK BURNETT

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[Written specially for "Cost and Management"]

CANADIAN manufacturers in general do not yet properly appreciate the value of services which professional engineers are able to render in connection with the various industries carried on in this country. This assertion can be made with authority by the writer, after years of experience in visiting factories throughout the country, although his line is not one which deals with the branches of engineering relating to industrial establishments.

One reason, and possibly the chief one, is the fact that many of the plants have, like Topsy, "just growed." From small beginnings, many factories

FREDERICK BURNETT

have become large units, and, having done very well, the management is satisfied and self complacent.

It may be said that a large percentage of our Canadian factories are inefficient in some degree. In nearly every instance which has come under the writer's observation there are departments where expert advice would lead to great economies. The difficulty is to interest manufacturers in anything which they fear would require further capital investment, in times of slackness of trade particularly, such as we have been experiencing the past few years.

To many manufacturers it seems like throwing money away to pay an expert engineer for consultations with their executive and operating staffs, but there can be no better investment than an expenditure which will show how money may be saved in operating and processing. If you pick the proper man, he will give due consideration to suggestions of your staff, and defer to their ideas where it can be shown that they are sane and feasible. You pay the expert's fees only once, and should reap the benefits arising from his recommendations continuously. Any expert engineer would be pleased to visit your plant and make a preliminary examination without charge. If he saw reasonable possibilities of effecting worth while economies he would so advise, and discuss terms for a detailed report on what should be done.

If, on his first visit, he finds your factory equipment and operating methods are up-to-date in all respects, so much the better. You can then throw out your chest and feel satisfied that your competitor has nothing on you, but if he can draw attention to points where improvement may be made and production costs lowered, would it not be good business to have him study your plant further, and then give careful consideration to his recommendations? In either case the professional engineer's fees would be justified.

Suppose you are not feeling just right physically. If you are wise, you go to your Doctor. If he tells you, after an examination, that you are organically sound, and simply need to take a little more care of yourself along certain lines, do you mind paying his bill? Or, if he finds conditions which are or may become serious if you do not submit to an operation, or radically change your mode of living, do you regret having gone to him? Not much. You would gladly spend whatever is necessary to bring you back to normal good health, and still feel that you owed your Doctor a debt of gratitude for diagnosing your case and applying the proper remedy.

If it pays you to keep your body at 100 per cen. efficiency, in no lesser degree will it pay you to have your plant studied and brought as near 100 per cent. operating efficiency as is possible, having regard to its particular conditions. Any factory which in any department is not operating at high efficiency is just as much in need of care and attention as your body, if the best results are to be obtained, and your products produced at the lowest possible cost.

The trouble is that most of us neglect our physical ailments until they become so serious that a cure is difficult, and many Canadian manufacturers treat their plants the same way, and only when it is too

late to put them on their feet again find they have been neglecting opportunities of effecting economies, by a short sighted policy of not engaging some competent man to treat the case.

You may think that because you live with your plant day after day no one from the outside could tell you anything you do not know about it. That may be quite true, but an outsider is much more likely to see points where improvements could be made than you are, particularly if the visitor is a trained engineer, thoroughly conversant with the most up-to-date equipment and methods for industrial service.

Canadian manufacturers have had many unfortunate experiences with incompetent or visionary so-called "Efficiency Experts," imported from other countries, but the class of men this article refers to as of value to Canadian industrial establishments are in a totally different category, and are to-day serving a limited number of firms with complete satisfaction.

You have probably been repeatedly approached by salesmen for factory equipment, each telling his story of how much better his goods are than the other fellow's, with the result that you may have arrived at the conclusion that Solomon was not far wrong when he made his famous remark about liars. Quite naturally every salesman is satisfied that he has the best line, and only a man who devotes his life to a study of his particular profession, has a proper education or many years of experience, and, besides, is free from entanglement with any particular type of equipment, plant or design, is in position to make recommendations to you which are unbiased.

In the United States and Great Britain the value of engaging reputable professional engineers in connection with factory development and operation is appreciated to a much greater extent than in Canada, and if Canadian plants are to keep up with the procession they too should have the benefit of expert advice.

Numerous examples of inefficiencies in Canadian plants could be cited, but for obvious reasons that would be inadvisable. At most of these plants the management is entirely satisfied that they are accomplishing the very best results, yet an expert engineer can easily see possibilities of improvement.

The man who knows he does not know it all, and is willing to have others advise him, is the man who makes the greatest success in life, and the manufacturers of Canada should endeavor to bring their factories to the highest point of efficiency, as only by such action can they best meet competition and conserve our great natural resources. Inadequate or obsolete methods of utilization of raw materials and labor are at the present time causing waste to the extent of hundreds of thousands if not millions of dollars in the factories of Canada each year. The Governments have no authority, unfortunately, to check this waste, nevertheless it is a serious matter to our country.

During the late war, when Governments exercised more parental authority over industry, some radical economies were effected. As an instance of this, the U.S. Government, during the severe coal shortage of 1917-18, formed an organization to study and report as well as license coal deliveries to factories. When a manufacturer applied for a certain tonnage of coal for his plant, the latter was visited by an engineer of the organization referred to, who studied the factory equipment, and if he found the utilization methods inadequate cut down the tonnage of coal proportionately. Some factories were allowed only 50 per cent. of their requisitions, by reason of the inadequate and inefficient type of steam plant they possessed, with the result that they were forced into action, engaged competent engineers, and soon had their plants rejuvenated, and from half the coal they formerly used the required power or steam was developed. The cessation of hostilities suddenly stopped this activity before it had attained very great momentum, but the results from only a very short period were remarkable, and not one of the firms, forced against their will to better their efficiency, would think of reverting to their old and antiquated methods.

Waste of materials and labor is an economic crime, and many of our Canadian manufacturers would be convicted were it possible to bring them before a Court where lack of efficiency in utilization of materials and labor would mean conviction.

For the greater good of our splendid Dominion it should be the effort of everyone operating a factory to so run it that a charge of inefficiency could not be brought, and such a desirable position may be attained if our manufacturers become alive to the value of engineering service. By reason of the excellent educational facilities provided by our Universities and Colleges, and the wide practical experience which a large number of graduates have obtained, there are professional engineers located in Canada second to none in attainment and ability to render valuable service to Canadian manufacturers.

Engineers, however, rarely come to you and seek an engagement. They usually await your approach, while men in other lines, also having something good to offer, do not hesitate to tell you what they have to dispose of.

So the approach must usually be, perhaps unfortunately, by the manufacturer to the engineer, and only if the former is keenly alive to the situation will the engineer have the opportunity of helping him.

APPLIED ECONOMICS

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Article I.
PRODUCTION

Production Defined.

Political Economy has been defined as the science of the production, distribution, and consumption of wealth. It has, therefore, three great departments. Of these three, production is naturally the first to be considered. In point of time, at least, it must precede distribution and consumption since it is the means and consumption the end.

Production may be defined as the creation by mankind of values or utilities (those utilities which

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are created by man are limited in quantity—if they were naturally unlimited in quantity he would have no motive for creating them—and thus always possess value). These values or utilities may be created in a number of different ways.

Kinds of Production.

In the first place, production may consist of a re-arrangement of particles of matter, resulting in *the creation of what economists call form utilities.*

This kind of production takes place in the case of agricultural products, where the particles of matter, which were useless to man as long as they remained in the soil, become useful to him when they are transformed into plant tissue and are thus rendered available for food. So, too, a form ultility is created when useless ore is changed into useful metal by smelting, or steel ingots are made into watch springs.

Secondly, production may consist of a transfer of matter from place to place, or what we may call *the creation of place utilities.*

An instance of this is found in the transportation from the Niagara Peninsula to Toronto and other cities of surplus fruit which would otherwise rot uselessly upon the ground. The creation of place utilities occurs whenever farm produce is increased in value by transportation to the cities, or whenever manufactured articles are increased in value by transportation from the city where they are manufactured to the farm.

All our transportation agencies, railway companies, express companies, etc., are engaged in the creation of place utilities. These companies employ a considerable portion of the working population of the country, and these workers are just as much producers as are the agriculturists who actually raise the fruit or other products on their farms, or the manufacturers who make clothes or any other manufactured product.

Next, production may take the form of *the creation of time utilities.* These come into existence whenever some perishable article, which is of little or no value at some times in the year, is artificially stored away and preserved until it becomes scarce and in much demand, and consequently acquires a high value.

The most familiar instance of this is the ice-harvest. The ice is cut when it possesses little or no value, is preserved artificially, and sold at the time of year when it is scarce and possesses great utility, and consequently considerable value. The cold storage plants for keeping meat, butter, eggs, and other perishable commodities in good marketable condition, are another instance of production by the creation of time utilities.

Lastly, production may take yet another form—*the creation of possession utilities*—the transfer of goods from a person to whom they are of little utility to some one else in whose eyes these same articles have greater utility.

The grocer who sells vegetables is just as much a producer as the farmer or market-gardener who grew them, since he creates a possession utility by transferring these goods to the person to whom they have greatest utility—the ultimate consumer.

But what about professional men—the doctor, teacher, preacher, lawyer, etc.? From the point of view of the man in the street, they are unproductive because their efforts do not result in the creation or modifying for consumption of any tangible and ex-

changeable commodity. This conclusion, is, however, erroneous.

The consumer, as we have learned, is the person who decides what has utility for him and what has not. Under certain circumstances, he prefers to spend his dollars to pay a doctor to cure him or a teacher to enlighten him rather than for tangible commodities. A young lady may prefer spending a dollar for a seat at the theatre rather than for a box of chocolates, preferring the intangible service rendered to her by the actors, to the tangible commodity. The service of the doctor, of the teacher, of the actor, is thus weighed every day in the market against tangible commodities by the consumer, the final judge. In many cases the consumer decides that the service of the professional man has more utility for him than any commodity which he could buy for the same money; so he spends his money for that service. We must accept his judgment, and accordingly we conclude that *doctors, teachers, preachers, actors, and other professional men are producers of utilities embodied in services—service utilities.*

Production Never the Creation of Matter.

It must always be remembered that *no human being can create matter.* Matter, the physicists tell us, is indestructible; the total amount of matter in the universe is a constant quantity; it can neither be increased nor diminished. All that man can do is:

(1) to change the form of matter—*form utility;*

(2) to change the position of matter—*place utility;*

(3) to keep matter in the same condition when it would be naturally changing and deteriorating—*time utility;*

(4) to transfer the possession and ownership of matter from the person to whom it is less useful to the person to whom it is more useful—*possession utility.*

In all these ways matter may be made more useful to man; its latent possibilities of doing service to man are "led forth" (Latin *pro* forth, *ducere* to lead) and thus "production" takes place. Finally, as we have seen, "production" may consist in the rendering of service by man to man.

REQUISITES OF PRODUCTION

Primary and Secondary Requisites.

There are at least two things absolutely necessary to the production of commodities, the predominating type of production—first, matter upon which to work; second, man's labor force working upon that matter, and bringing it into a more useful form. But that labor force needs to be supplied with tools and sustained by food in order to produce most efficiently, so that we may say that something else than matter and labor is required in the higher branches of production at least. The first two requisites of production—called primary requisites—are generally known to economists as land and labor. A mediaeval writer on economics has said that labor is the father and land the mother of wealth. The last mentioned requisite—a secondary requisite—necessary for all but the most primitive kinds of production, is known as capital, which may be defined as the product of past labor used to subserve the process of present production.

Land—Definition.

These facilities consist primarily of land and water, the former of which provides the material for the great bulk of food products and minerals, while the latter affords by far the cheapest means of transportation and also contributes an important part of the world's food supply in the form of fish—a resource which was drawn upon to an unprecedented degree during the Great War. Some day, when its resources of animal and plant life become more necessary to mankind on account of the increasing population of the world, its possibilities will no doubt be more fully developed, and the sea may conceivably become the greatest source of the world's food supply, as Jules Verne foretold in "Twenty Thousand Leagues Under the Sea."

Secondly, the term "land" includes the motive powers used by the manufacturer, for instance, coal and water-power. For a manufacturing country, an abundant supply of good coal such as exists in England, Nova Scotia, and Alberta, or an abundant supply of available water-power, such as exists in Eastern Canada, is an asset of incalculable importance, enabling these countries to undersell competitors who have no such cheap and abundant motive power.

The economic term "land" includes, therefore, all that is ordinarily meant by "natural resources." Now the prosperity of our nation or any other depends very largely upon the amount of production made possible by the natural resources of the country—its forest, agricultural, and mineral wealth, its fisheries, and its coal, and water-power. National greatness must be based on economic prosperity, and the first requisite for economic prosperity is a generous outfit from nature.

Labor—Definition.

No matter how great the natural resources of a nation may be, they are of little avail to increase its positive riches until they have been exploited by man. They resemble the tools in the workman's hand, which are of great assistance in enabling him to produce what he could not otherwise produce so well, but are quite useless without him. These natural resources are not wealth in themselves any more than is a man's power to labor when he is unable to obtain work. For wealth to be produced, it is necessary that man's labor be applied to the natural resources.

Labor is defined as effort, bodily or mental, put forth by human beings, not exclusively for the sake of the pleasure immediately associated therewith, but partly or wholly with a view to the attainment of some ulterior object.

Labor as stated in our definition includes both mental and physical effort, though in ordinary language "labor" refers usually only to physical toil. In economics the cabinet minister and the college president are laborers, because their efforts enable men to produce to better advantage than formerly. The cabinet minister aids production by administering the law justly and securing to each his own property—a great stimulus to hard work. The college president is a laborer, because his is the task of determining and putting into operation the curriculum best suited to the needs of his students. If he has been able to gauge correctly the demands which society will be likely to make on his graduates and to develop men who will measure up to those demands, he will have rendered a very real service to the community. Perhaps no one is ultimately more productive than the man engaged in developing the physical, mental and moral qualities of mankind.

Labor is performed, not for the sake of the mere performance itself, but for some ulterior end. Thus playing a game is not usually labor, but exercise in the gymnasium is. That is usually undertaken for the ulterior end of preserving one's health. In the game, on the other hand, one forgets that he has a body to develop, and simply enjoys himself.

Labor—Its Object.

The ulterior end of labor is the production of utilities which the worker himself may consume or with which he may secure other commodities for his support and for the support of those dependent upon him. Labor in itself is irksome, but its irksomeness is borne because of the advantages which accrue from it to the worker. The utility of the commodities to the worker outweighs, up to a certain point, the disutility of the labor. But in every process of production a time will come when the worker's weariness is such that the disutility of the labor will outweigh the utility of the commodities gained by his labor. Then, if he is free to do so, the worker will cease to labor.

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PURCHASING

By R. M. SEDGEWICK

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(A paper read at the Toronto Chapter, Canadian Society of Cost Accountants.)

PURCHASING is one of the essentials of industry. In every business organization, no matter how large or how limited its scope, some one or more individuals must assume the responsibility of buying the material. Much of the purchasing in industry is necessarily incidental. The small business office and the small mercantile concern cannot afford to delegate the work of buying as the sole responsibility of a single individual. But in the field of large merchandising operations, and particularly in the field of industry which we know generally as manufacturing, purchasing is a broad and important undertaking.

What are we in business for? If we are a manufacturing or distributing concern, we are in it with the primary hope and purpose of making profits for our owners or stockholders. If we are a utility, such as, no doubt some of us here represent, we are in it to serve the public well, to make a fair return upon our capital, so that the investment may be attractive; and, if we can do an increasingly efficient job through the various functions of Management, to turn added profits back to the public through reductions in the cost of service, and at the same time create public goodwill.

IMPORTANCE OF THE PURCHASING DEPARTMENT

Now, there isn't a more vital spot in an organization than the purchasing department, no one place where profits can be so advantageously secured or where losses can be more easily incurred. Isn't it plain that on a basis of fairly well fixed selling prices, such as you will find in the general competition of smaller industries, every dollar saved by a good purchase is velvet and every dollar lost by a poor purchase has to be regained by extra sales effort or further manufacturing economies?

Everything manufactured is a combination of two elements—labor and material, the proportion of each in a specific article varies according to the characteristic of the article itself. In jewelry, material usually involves a greater cost than labor. In precision instruments, of the kind generally used in chemical, engineering and scientific industries, the item of material is usually inconsequential and the labor factor is the most costly in determining the ultimate value of the products. Between these two extremes comes the general run of manufactured goods, in which the item of material represents from 30 to 60 per cent. of the ultimate cost.

It is apparent, then, that material is an important factor in relation to manufacturing costs; therefore it follows that through careful judicious and economical buying, great savings are possible, and of course it is obvious that there are great possibilities of waste through careless or hit and miss buying.

Increasing Ratio of Material on Cost

Judicious purchasing is becoming more and more essential as the years go by. This is true because the tendency is for labor to represent a smaller and smaller proportion of the final cost of the product; new machinery of all kinds is being put on the market every year to replace costly manual operations. For example, the price reductions which characterize the automobile industry from time to time are almost wholly attributable to improved methods of production: so, as labor costs decline, the proportionate value of material in the product naturally goes up. It therefore follows that more care must be used in purchasing raw material than was necessary when labor overwhelmingly dominated manufacturing costs. All of the economies and savings which may be gained through the use of automatic machinery and improved process of production may be lost by careless and injudicious buying of materials.

The manufacturer who does not buy right finds himself at a serious and ofttimes hopeless disadvantage in meeting the competition of those who follow modern and efficient methods of purchasing.

Definition of "Purchasing"

Purchasing cannot be done on a hit and miss method. A single bad purchase may cause the failure of the company or at least cause great embarrassment. The word "purchase" has several meanings, but the definition that seems to me the most applicable for our purpose to-night is "to obtain by paying an equivalent." It follows, therefore, that close attention and application is necessary in order that you do not pay more than an equivalent. The difference between efficient buying and haphazard buying is, conservatively speaking, about ten per cent. of the amount expended. Viewing industry as a whole, forty cents of the sales dollar represents labor, overhead and profit combined. Sixty cents represent expenditure for materials. These figures are based on the Statistical reports of the United States Department of Commerce.

This means that the average plant with an annual output valued at $1,000,000.00 spends $600,000.00 for material. Ten per cent. saved on that expenditure is $60,000.00 or six per cent. of the maximum sales volume. We do well, in view of this, to seek a profit at the beginning. A popular conception is that the way to save money in buying is to hammer down the seller's price. That procedure never succeeds in permanent savings. It will succeed once, perhaps, but the next time the price will usually start high enough to yield a profit to the seller, under any process of hammering.

Four Principles of Good Purchasing

The profits of purchasing are not dependent upon intricate rules or sharp practice. The formula is simple. Buy the right goods, at the right time, in the right quantity, from the right source. Always doing that would mean perfection in buying. None of us can attain to that, but a high degree of perfection is possible of achievement.

FIRST, buy the right goods.

Quality is the first consideration and not price. The right material to buy is that best adapted to the purpose for which it is bought. Economy in materials cannot be measured in units of initial price. It must be measured in the cost of units of service. A material of insufficient quality is costly because it must be replaced before the desired service can be secured. A material of higher quality than necessary involves waste of service units. A statement frequently made by manufacturers is, "We buy on quality, not on price." That statement betrays lack of knowledge of purchasing fundamentals, for the right material is determined by analysis of both quality and price. It is probable that industry wastes nearly as much in buying materials of unnecessarily high quality as it does in buying inferior quality for the work involved. The right material for any purpose cannot be determined by rule-of-thumb. It can only be determined by thorough and competent study of performance requirements. Knowledge of materials is an absolute necessity and this can be gained by keeping in touch with the uses the goods are to be put to in your own company and also with sources of supply.

Studying the performance of materials in the plant may be expected to enhance the practice of buying by specification. Many manufacturers look upon specifications with disgust and it is true that the tendency in some cases is to clog a specification with meaningless phrases and drastic stipulations.

Proper Specifications

For example, a manufacturer who used large quantities of leather belting had a specification which started off in this fashion: "All leather belting shall be made of green salted native steer hides." Now, no man, whether he is an engineer or belting expert, can tell by examining a leather belt whether it is made from hides that are green salted, or dried, nor can he possibly tell the nativity or sex of the animal from which the hide was taken. But a reasonable specification in whatever form it is compiled serves both buyer and seller. It establishes clearly the requirements to be met, it places competition on a uniform basis, and it provides a foundation for tests to determine that the material delivered is as specified. The constantly expanding use of specifications reflects improved buying because it constitutes intelligent buying. It is this phase of purchasing, particularly, that requires the buyer to keep in close touch with sources of supply. The producer, because of his intimate knowledge of his own manufacturing problems is frequently in a position to guide the buyer in the final determination of quality. It is

obvious that a standard grade of material produced in bulk can be sold at a lower price than a special grade; and the producer can often suggest a slight modification of the specification which will permit the standard grade to be furnished. From every standpoint of economy in manufacturing and utilization, it is best to use standard grades or sizes, if they can be adapted to requirements.

The buyer who studies inside and outside the plant, the commodities he uses, will buy the right material in a far greater percentage of cases than the buyer who does not. The profits of purchasing are accounted for in great part by buying the right material.

SECOND, by at the right time.

This is a factor equal almost in importance to buying the right goods. The right price is not necessarily identical with the lowest price obtainable. Let us say rather that the right price is the lowest one consistent with sound business procedure, which at the same time assures continued satisfactory relations with the supplier. The meaning is that the price at which we buy must be one which assures us of the greatest advantage in view of the market and cost to the supplier, and also allows him a margin of profit satisfactory to the requirements of his business. Material has been bought at the right time if when put to use, the price paid is less than the then prevailing market price. You cannot show a perfect score in this regard, but you should be able to show the majority of your transactions below, rather than above, the line of price comparison. The most conservative way to handle the price factor is to buy continually in just sufficient quantity to meet the immediate manufacturing demand. The other extreme is the buyer who will take a chance and gamble on large quantities without proper investigation. In the first case, the buyer never takes advantage of low markets and so loses the opportunity for his concern to profit on raw material; whereas the second man, by speculation, takes far more losses than are necessary and in all probability over a period of years is worse off financially than the too conservative buyer. There is, however, a path midway between these two extremes, which in large measure, combines the safety of the conservative buyer with the price advantages to be gained from speculative buying; study, and understanding of all factors affecting the demand and supply are essential. Under the conservative method of purchasing, the buyer need know nothing of markets or business cycles, but the moment material is bought ahead, very close watch must be kept on the markets and their relations to general business. This is illustrated by the basic principle followed in purchasing from a *price* standpoint.

One buys from hand-to-mouth at peaks of either good or bad business, because when business is at the peak of prosperity, all commodities are at their highest price, and when the downward swing comes, one does not want to be loaded with raw material bought at the highest price.

Everybody would like to buy at the bottom, but the bottom is difficult to foresee until the corner has been turned; when one is sure this turn is made, buy heavily, decreasing as it is thought another high peak is approaching.

On the dropping curve, from good to bad, business action is exaggerated, believing it better to pay for express and telegrams, rather than to take large losses in raw material.

Now, it is perfectly obvious that if one is able to locate this position on the business cycle and follow the basic principle, one will always be well bought. It is not difficult to save money in purchasing just after we have passed the low point in depression, for every purchase will prove profitable, but as we go up the curve of improving business, our problem becomes far more difficult and markets must be followed far more closely.

Just before the break comes, everybody is busy; deliveries and transportation are in their most difficult position and the factory organization is crying for raw materials. This is the point where statistics and experience must guide us, and the point where, if we wish to remain in the conservative class and keep out of the speculative class, we must be guided by cold facts and not misled by superficial conditions. One is *NEVER* justified in buying ahead to beat price, unless available statistics prove saving will result.

To justify itself from a price standpoint, a purchasing department must, over a period of years, have bought relatively more of each commodity below than above the price average of that period.

From a buying standpoint, knowledge of price of any commodity is not sufficient; the reason for that price must be known before intelligent purchasing can be done. The total production, the normal consumption, stocks in warehouses and consumers hands, are some of the factors to be studied when determining a buying policy.

Study the intrinsic value of the thing you buy. Compare it with the worth of other commodities and form an opinion as to whether its price is above or below par.

The gathering of all the information necessary to buy with judgment will necessitate the continual study of trade papers, business papers, financial papers, Government Statistics and such like. Trade associations are also a splendid source of reliable information. The salesmen who call upon you can be of valuable assistance to you and many of them are well posted on general business conditions. Study the business barometer, the stock market, bank

deposits, clearings, production and price of pig iron, railroad car loadings, and everything that will help you to a clear understanding of business conditions.

A careful study of conditions and a record of prices will ofttimes enable you to make large savings. A manufacturing concern which was not very prosperous made a study of the price trend of its principal raw material and found that, over a period of years, this material in the same month each year was at its lowest price for the year. They naturally, therefore, increased their storage capacity and purchased a year's supply during that month.

Take another instance,—A friend of mine is buyer for a very large Public Utility and was in the market for a given piece of equipment. This particular equipment was of comparatively simple makeup, consisting of four elements: gray iron castings, copper tubes, structural steel and steel bars. The price quoted was seventy cents per pound. He proceeded to "breakdown" this price into its component parts. He found the gray iron castings would cost about 6 cents per pound, the copper parts 30 cents per pound, the structural steel 5 cents per pound, the steel bars 10 cents per pound. By the use of the weighted averages of the pound price figure for each component, he arrived at a price for the material manufactured, but unassembled, at 26 cents per pound. You will note at once a considerable differential in this price and the price quoted, viz., a difference of 40 cents per pound. The quoted price was entirely out of line. The result, a new source for furnishing the article in question at 40 cents per pound, or a purchase dividend on this one deal of $4,800.00.

These two illustrations show what can be achieved by scientific purchasing.

THIRD, buy in the right quantities.

Hand in hand with the right time to buy, there is also the important question of the right quantity to buy as quantity has an effect on price. Quantity buying is one of the most important principles of scientific purchasing. It is either consciously or unconsciously used by every successful purchasing agent in the country to-day, but is also common practice in the personal purchase of such familiar articles of clothing, cigars, and other incidental items.

On the way to my office each morning, I used to pass a certain fruit stand. It occurred to me one day how pertinent an illustration of the principle of quantity buying could be observed in the selling methods of this fruit peddler. On the top of his fruit stand is an ordinary paper bag. Printed on the rough paper are these words: "Bananas 3 cents —2 for 5 cents." In probably no other way can one find so simple and yet so forcible an illustration of the phase of scientific purchasing now under discussion. Let us see for a moment what this fruit peddler is doing. Primarily he is appealing to the natural desire of mankind to obtain equal quality at a lower price. This price concession is blazoned forth from the top of the banana cart. It constitutes a definite offer to all prospective buyers. It is just as if a firm supplying certain important equipment to the concern for which you are Cost Accountant would make you a definite price concession in view of increased quantity orders. The difference, however, is this: The modern, efficient purchasing agent cannot wait for such definite offers but must build up his quantities in advance and then solicit and insist on favorable arrangements consistent with his ability to make his business attractive to suppliers. He cannot sit tight and wait for his suppliers to advertise price concessions from the top of a banana cart. He must plan constructively to use the leverage of quantity buying. There are three principal methods of procedure which the purchasing agent may follow in his efforts to build up quantity:

1st. By centralization of purchase: By centralization is meant the pooling of requirements of several units of an organization so that orders for sizeable quantities may be placed at one time for all branches or departments of the company.

2nd. By standardization of materials. By standardization is meant the reduction in number of unnecessary sizes and designs to the fewest possible types serving the widest use, thus increasing the number of units purchased of certain types.

3rd. By the elimination of repeat orders and rush orders. By the elimination of repeat orders is meant doing away with the practice of placing orders at frequent and regular intervals when the same orders could be combined and savings obtained by covering larger quantities under a single order.

Centralized Purchasing

In the case of a large firm having various outlying branches, economies may be effected by allocating the purchasing function to the responsibility of a single department at headquarters. This applies to smaller concerns also, the different departments of which may requisition material through a single purchasing department. Such a combination of the purchasing functions, either for a large organization or for a comparatively small firm, means that a strongly centralized purchasing department is responsible for the buying job for the company as a whole.

In the average concern where centralized purchasing has not been adopted as a working policy, several departments may be buying the same material independently. For example, the Stores Department, the Plant and Clerical Department may be each ordering various articles of stationery, such as paper, pencils, clips, separately. It would surprise you to learn of the savings that may be effected

through centralized purchases of even these small items under one head. It is even more surprising to learn of the waste and unnecessary losses which have occurred in certain instances where different departments or branches of the company have been found competing in the market against each other. The centralized purchasing program does away with this wasteful internal competition and is the first step to be taken by any company which wishes to experience the benefits and savings possible through quantity buying.

Standardization

The second step to be taken by the purchasing agent in order to build up quantity is to adopt the principle of standardization. The adoption of standardization makes possible the purchasing in quantity of a comparatively few types of articles rather than small purchases of many different types of material with consequent higher prices. It is one of the most effective ways of building up quantity and increasing purchasing power. The purchasing agent who wishes to standardize will find hearty co-operation from the manufacturer because it fits in with his scheme of management. In considering standardization, the attempt should be made to adopt standards which are as nearly as possible commercial. The so-called "special item" is expensive and often unnecessary. A commercial article can usually be found to meet requirements and if so should be given a preferred position by the purchasing agent. Commercial standardization can easily be adopted in many cases with resultant advantages of lower prices, ready availability in case of urgency, and the additional advantage of uniform and known quality.

One of the necessary factors in the principle of standardization is buying to specification. By the careful preparation of specifications or by the use of such specifications as are already available, a more perfect understanding regarding quality exists between the buyer and producer, losses due to rejected materials are avoided, and the manufacturer is able to produce on a definite basis rather than according to a rule-of-thumb method.

Combining Purchases

It is advisable to make a careful study of requisitions in order that recurrent orders, as for example, when requisitions for certain materials are received at regular intervals, may be combined and covered under a single contract with resultant savings. This requires the study of past purchases as well as an estimate of future requirements. While it is not often possible to anticipate the need for certain material with certainty, careful study of the purchase record of the past will enable the efficient purchasing agent to combine orders for material rather than break them up into small orders placed at frequent intervals. The former method often makes it possible to make one or two contracts for larger quantities over longer periods of time with the benefits of better prices and better service. By allowing the requirements to be broken up into small lots, purchasing power is lost and the benefits of quantity-buying lacking.

Co-operation and mutual understanding between the purchasing department and other branches of business is necessary in order to eliminate such evils as the so-called "special item," frequent "rush" orders, and recurrent requisitions for materials in small quantity. Understanding that the purpose of the purchasing agent in eliminating these evils is constructive and practical usually overweighs objection from other departments, asking lower prices, better service, etc.

FOURTH, buy at the right source.

To buy correctly, you can only afford to pay one profit, so wherever possible, deal direct with producers, especially when the volume warrants this method. There are some commodities which must be bought from brokers or distributors, but a great deal of money is spent in the form of unnecessary profits to middlemen. You will find lots of individuals and corporations thriving upon the inexperienced buyer. These get the goods they sell from the manufacturer and pay the same price which the buyer himself could obtain. Make yourself familiar with all these conditions and profit by them. The nearby shipper, all things being equal, is your most economic source of supply. By buying from the nearby shipper, your stocks can be more easily regulated and transportation difficulties are not liable to hamper your operations.

To sum up, certain data is necessary for guidance in purchasing:

1. That which indicates *what* to buy.
2. That which indicates *when* to buy.
3. That which indicates *where* to buy.
4. That which indicates *how much* to buy.
5. That which indicates *how much* to pay.

"The object of records is to increase the scope and number of warnings, to give us more information than is usually received immediately through our senses," says Harrington Emerson. "The object or records is to annihilate time, to bring back the past, to look into the future."

It is not to be expected that the information procured under any of these headings will be sufficient to permit the exercise of infallible judgment in making purchases. Theoretically, purchasing may be reduced to an exact science; practically, it can never reach that point. But I think you will agree with me that the application of the principles I have mentioned cannot help but make for economy in the running of any business.

In Time of Prosperity Prepare for Depression

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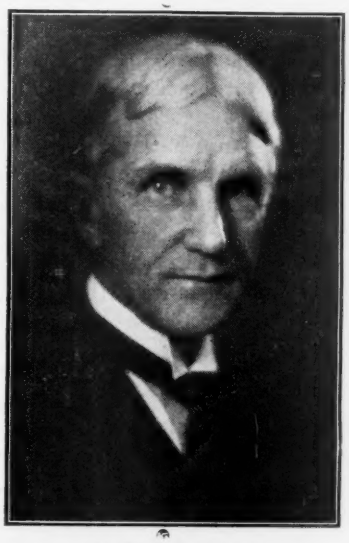
HARD times have disheartened the human race since the dawn of history. The course of economic well-being has never run smooth. At irregular periods, general conditions have turned against man. His hardest work, most careful thought and bravest spirit have no more than pulled him through these difficulties. These economic plagues are second only to the deadly pestilence. Frequently the latter has followed close upon the former in countries like India and China.

Reasons for Disasters

The causes of these economic disasters vary with the character of the basic industries and business of the people concerned. Explanations of their frequent



C. C. Arbuthnot

return vary from a failure of harvests, beyond human control, to psychological conditions involving a weakness in the human spirit. Between no crops and no courage as reasons for economic collapse, one may find a combination of influences that help to make clear the reasons for the recurring evil. If these basic facts were widely known and men persuaded to act upon this knowledge, the next step of prevention would be less hard to take.

Agricultural Depression

The economic troubles of man in the hunting stage of human progress may be passed over for those commonly faced when agriculture was the chief employment. No better example of this type of hard times can be found than that of the seven years of plenty and the seven years of famine in the land of Egypt in the days of Pharaoh and Joseph. In the dream, interpreted by Joseph, abundant harvests for seven years were predicted. These were to be followed by seven lean years when the land would utterly fail to respond to man's labor. There was nothing "psychological" about this type of calamity. It was due to external conditions, not of man's thinking, but of nature's inconstancy. Egypt's experience of short harvests have been repeated throughout the world in agricultural regions. Advanced countries that enjoy very good transportation have been freed from the worst effects of this kind of misfortune because nature's failures are usually local and can be offset to a degree by importing the surplus of other parts of the earth.

The story from Genesis has in it the key to sound policy. In the years of great plenty Joseph stored the surplus grain to offset the scarcity of the seasons in which, according to prediction, crops would fail. He has been charged with monopolistic practices, of "forestalling, regrating and engrossing." As a matter of fact, he first proclaimed and practiced the sound economic policy in regard to recurring good and bad times: in time of prosperity prepare for depression. The success of this statesman-like program need not be obscured by the hard bargains with which he compelled economy among the Egyptians in time of scarcity. They probably cartooned his corn-cribs in the years of plenty. Perhaps they said he was doing all this for profit and not for service.

Excessive Land Speculation

In contrast with the prosperity and depression of agricultural countries based upon physical facts, one may turn to the booms and collapses that orginate in men's minds. Land speculation is a well-known case. Imagination becomes active in regard to the probable increase in land values. In new countries, or even in newer sections of established cities, hopes and expectations run faster and faster regarding the local development. Purchasers of land offer higher prices because in turn they expect to sell for still higher sums. The vigor of this excessive optimism warms into a flame that fires the thoughts of whole communities and attracts strangers itching with the desire to participate in these gains. The flame fed by oncoming buyers becomes a raging fire. Whatever orginal favorable prospect existed is forgotten in the flaring hopes of the boom. Time, however, allows some of the fuel to burn out. A sober second thought begins to have a chance. It is realized that prices have been lifted far beyond what earnings of the property will justify within a reasonable period. The rapid rise in values is halted, a fall begins and often continues to a disheartening,

low level. Hopes turn to ashes. Of such a situation some one has commented to the effect that the saddest sound in nature is the dying echo of a departing boom. Hard times have arrived.

Business Depression

These two types of prosperity and depression represent the extremes in the causes of good and bad times. One is independent of man, due to nature's changeableness, beyond his control in its origin. The other is the result of his own activity, the creation of his own mind, to which he eventually falls victim. The type of prosperity and depression that afflicts the advanced countries to-day is different from these two simple sorts. Our troubles are centered in the fields of industry, transportation, commerce, and banking, rather than in farming or land speculation. In these enterprises we are plagued with expansions and contractions. The causes are in part beyond our immediate control and in part subject to our will. Unless we are enslaved to our imaginations and the victims of immediate desire, we can exert ourselves in the field where we have a degree of choice and offset to a great extent the consequences of fluctuations we cannot entirely check. Just as Joseph did not let the Egyptians run riot in the years of great plenty but made every effort to get ready for the famine, so we can substitute sober thought for irresponsible excesses in prosperity and, as a result, avoid the extreme hardships of depressions.

What is Prosperity?

The recurrence of good and bad times is now a recognized fact by most careful observers of economic conditions. The term "business cycles" is accepted as descriptive of the swing from prosperity and back again. One well-known writer and speaker on business topics, on the other hand, has combatted this idea, declaring that there is no more reason to expect business contraction to follow expansion than to look for disease to succeed a condition of health. "Because a man is well is no reason for expecting him to become sick," he declares. His error lies in assuming that "prosperity" is a condition of health. Prosperity is a condition of over-stimulation, not of sound business. The declaration truly should run: "If a man is intoxicated the night before, he will be unhappy the morning after." Prosperity and depression both are excesses. There is no normal condition of steady uniformity. The usual tendency of economic enterprise is to move from one extreme to the other.

Normalcy

If an imaginary condition of steady business progress were represented by a horizontal line, a curved line rising above and falling below this horizontal line would suggest the actual trend of industry and commerce. One student of the problem thinks the area of prosperity (the spaces included between the curved line and the horizontal, above the latter) are equal to the areas of depression (the spaces included between the curved line and the horizontal, below the latter). Another alleges the modern business world is in a state of depression interrupted by occasional bursts of prosperity. Another shows that the balance is in favor of prosperity as compared with the duration of depression. Whatever conclusion is come to on this point is not as important as the recognition of the experience that both prosperity and depression are temporary conditions. Neither is "normal" in the sense of "stable and continuous." Neither will last.

The Dangers of Prosperity

There is something in the fact that we never talk of business cycles in periods of prosperity. The buoyancy in the air keeps our minds off the possibility of a decline. This sunny outlook has abundant advantages that need no emphasis. The unhappy effect of such an attitude appears when bad times come. Not until we are plunged into depression do we think of remedial measures. Then a good many frantic gestures toward making work for the idle men are mixed with exhortations "to do something." There is a demand for a national conference. The conference in turns calls upon the local authorities to do something. The time "to do something" is in the period of prosperity, not in the time of depression. The beginning of wisdom in this matter lies in the knowledge that "prosperity" is a period of economic overstimulation, not of sober strength.

Over Expansion

The prosperity out of which we fell in 1920 was the product of the most powerful stimulant ever given to business. War-bred demand for commodities is not to be denied in its insistence on quantity and speed of production. Higher prices are the means of offering the higher percentage of profit required to change equipment from the creation of goods useful in peace to materials serviceable in war. Huge gains are held out to the industries directly able to furnish armies and navies with supplies and munitions. The existing productive facilities are employed in the fullest measure. New buildings and machinery are constructed for the expansion of output. Everything possible is done to speed up the economic life of the country that must put in the hands of its soldiers and sailors all but unlimited means of fighting. There it nothing imaginary about this stimulant to business enterprise. War profits excite economic activity to the highest pitch. Feverish enterprise multiplies the capital invested and the labor employed in essential industries. Productive activity strains toward an upper level of dizzy height. War profits create war booms.

Next to war profits as a source of stimulation to prosperity comes, perhaps, the hope of gains

through the exploitation of natural resources. The United States has suffered from this cause many times, notably the boom and depression in the '30s and in the '70s of the nineteenth century. Canada was in a depression following a great period of prosperity due to opening up further her West, just before the great war.

In such attempts at exploitation of new territories an enormous demand for railway construction and equipment arises. Great building projects are launched. Armies of wage-earners are employed. Materials, food and clothing are required in unusual volume. The development is on a large scale that anticipates future growth. The whole country feels the effect of these buoyant efforts to gain profits by making the gifts of nature available to the world. Headlong plunges into riches of a continent have led to exceptional business activity throughout the nation.

When a business like the electrical industries or the automobile and related manufactures promises alluring gains an era of investment in productive equipment and building is begun. In the eagerness to gain the profits of these promising ventures capital is rapidly employed in creating machinery and structures required. This fresh demand for material and labor lifts prices and wages. The community feels the quickening thrill that comes from anticipated exceptional profits. It passes through the whole structure of business, intoxicating the leaders and followers in a wide variety of undertakings.

Cause of Irregular Business Activity

Because these stimulating influences appear at more or less irregular intervals business activity is not steady in its rate or progress. At these times a great increase in briskness occurs. The hope of exceptional profits is the quickener of business expansion at such periods. War demand for commodities, the exploitation of natural resources, or the development of new industries are the chief bases upon which the expectations of unusual gains are built. As causes of prosperity in an economic stage resting on business enterprise they correspond to the bounty of abundant harvests in an agricultural era. They are real in their character, not mere creatures of imagination. They are likely to recur indefinitely in the future, so far as can be seen. As long as nations cannot compose their differences peaceably, as long as there are any considerable areas of natural resources undeveloped, as long as inventive genius is likely to open new industries, so long may we expect the recurrence of these periods of stimulated business activity which we call "prosperity."

Influence of Credit

The speed and extent to which business responds to any of these quickening influences is due to the development of credit and banking. Captains of enterprise quickly see their chance for gain. They employ all their own capital and borrow all they can from the accumulated savings of others. In addition to these sources of purchasing power needed to extend their activities they, directly or indirectly, intentionally or unintentionally, divert to their projects a large volume of credit created by commercial banks. This latter type of credit is of great service to the community in promoting the purchase and sale of marketable commodities. When it is extended into the field of speculation and investment in the form of continuously renewed short-time notes it becomes a peril. The ease and rapidity with which such credit can be expanded and the possibility that it may be cut short when most difficult to pay off makes it both tempting and treacherous.

The structure of inflated business that we call "prosperity" thus rests upon a great extension of credit. All of its parts are interrelated as debtor and creditor. Most of these obligations can be met if the extended business yields the expected profits at the right time. If the ventures return less than anticipated, or do not produce the desired results within the time limits set by the credit obligations, bankruptcy in many cases will follow. The interrelation of the various concerns makes the shocks of failure pass through the whole group, even wrecking many remote from the field where the disaster began.

Prosperity Exaggerated

In addition to the volume of business directly due to the war demand, or the demand arising out of the exploitation of natural resources, or from investment in new industries, there is created a large amount of economic activity as a result of the contagious buoyancy that takes possession of men in "boom" times. They talk, think and act in large numbers and on a lavish, even rash, scale.

Personal extravagance becomes marked. Public officials get inflated ideas and initiate schemes for expensive public improvements. The voters readily approve liberal bond issues to furnish the funds. Manufacturers make extensions beyond the immediate demands of their businesses. Railways expand terminals, improve the right of way and increase the investment in motive power and rolling stock at a rate that eventually outruns the traffic needs. Construction, expansion, development are the words that represent the spirit of such times. Thrift, careful planning and conservatism fall far into the background.

Stimulated business cannot last. The original stimulant ceases. The war stops. The development of natural resources reaches the halting stage. The new industries get past the point of absorbing more investment. Calculations made in expectation of continued expansion fail. A slump begins.

Reflex Movement

Even within the "boom" period a depressing tendency appears and grows. The uplifting influence of the original cause of the expansion weakens before it ceases. From whatever source the quickening demand comes, its effect is due to the fact that it raises suddenly the prices of goods needed to accomplish its end, such as making war or hastening peacetime development. These prices rise above the current level and so increase the margin of profit above the expenses of production in the fields that feel the favorable influence first. The hope of getting these higher profits puts life into business enterprises. Their pursuit starts the procession of economic activity that marches rapidly into prosperity.

These high profits cannot continue long. The price of raw material soon begins to rise. Wages of labor go up. All the expenses of production in turn feel the new demand, move to higher levels, and so narrow the expanded margin of profit back to something like its average proportions. Thus is the vitality steadily taken out of the period of prosperity.

These two characteristics of such periods, the stoppage of the original initial influence, and the automatic shrinkage of the margin of profit, turn the rising curve of prosperity down toward depression. Just as the upward movement was hastened by the buoyant, psychological response to favorable conditions, so now the fall is hurried by the psychology of discouragement. Here is where the delicately adjusted credit structure reveals its weakness. The expectation of paying the debts created for purposes of expansion rested upon the hope of profits. The shrinkage of the latter and their final extinction, or the failure to appear on time, leave the debtors helpless. When a number of concerns thus go into bankruptcy they drag many more down with them. The retreat may turn into flight with each trying to save himself.

The Resulting Panic

This stage of rapid decline from prosperity formerly was usually marked by a financial panic that was succeeded by business depression. The acute panic was made pronounced by the weakness of our banking organization, rather than by the lack of such organization. Now that the Federal Reserve System has enabled us to use our banking reserves more effectively, helped to put the lending power in any part of the country at the service of the sections that need it, and furnished us with an elastic currency, the "panic" has been taken out of this stage of the business cycle. Solvent business men can get help. The disasters are practically confined to those concerns that are overextended and badly managed. We have prevented the financial panic. It was a long task to get our banks' affairs in position to accomplish this notable result. Years of agitation and education were required to bring the business world and governmental authorities to the level of interest and intelligence required to appreciate the possibilities of such an extraordinary service. Financial panics were almost listed as "acts of God." We now find them within human control. What we have done to the "panic" we can do to the "depression." Both are made by men. Men have unmade one. It is the next task to prevent the other.

Remedies

In attempting to prevent depressions in business the first step is taken when we understand that the cause of the trouble lies, not in the period of depression itself, but, in the time of prosperity. Our efforts to apply relief measures after we reach hard times have been largely ineffective. The sensible thing to do is to give a modern application to Joseph's ancient plan. If we adopt the slogan "in time of prosperity prepare for depression," the worst phase of depression will never come. The excesses of prosperity are responsible for the depths of depression. If we could reduce the former, the latter would never be reached.

The volume of business we call prosperity is made up, as indicated above, of two classes of activities. The first are those essential to accomplishing the main purpose of the period, such as winning a war, opening new natural resources, or developing new industries. The business in the second class is a by-product of the essential activity, arising out of it, but not necessary to the main end in view.

Spend Conservatively

As suggested earlier, the buoyant spirit in the air leads men to expand the essential activities to an unwarranted degree. Government divisions of all grades, Federal, State and local, easily run to lavish outlay. Great corporations in manufacturing and transportation go beyond immediate needs in making repairs, replacements and extensions. In short, booms are greater than the essential purposes of the period warrant. Inflammation of the imagination leads to excesses and the psychological influences get the whole community active beyond anything called for by the economic facts.

If the great spenders such as Federal, State and local Governments, the great business corporations, the railroads and the banks could make this distinction, it would not be hard to classify their activities into two groups, essential and postponable.

If the "postponable" activities were not undertaken in prosperity, it would be kept from rising to such extremes. There is bound to be some increase in volume of business due to the irregular recurrence of the stimulants indicated above, but it need not run away with men's judgment. If these postponable enterprises, or parts of enterprises, could be executed in the threatening period of recession from the

boom, the depression would not go to the low depths now reached. The crest would be taken from the wave of prosperity and carried forward to fill in part the trough of depression. Such a succession of changes would not be very serious. The hardships of both extremes would be reduced. No enterprises of any reasonable degree of efficiency would be endangered. The fluctuations in the volume of employment would furnish an easier problem than we now face.

There have been some moves made in the direction indicated here. The French railways before the war laid out a plan of repairs and extensions covering a number of years. The central idea of this scheme was the classification of the work into two parts: One, those activities which were essential to the current operation of the transportation service; the other, those which could be postponed without immediate loss in efficiency. The latter were to be avoided in boom times and executed when depression made it easier to get men and material. The English have a similar policy in the matter of highways. Many of our manufacturers have planned to make repairs and reline furnaces in dull times. A well-known cotton mill in New England had adjusted its business to anticipated fluctuations in trade for years. Congressional legislation looking to the adoption of such a scheme is under consideration. Writers on business cycles have made all degrees of suggestions looking to a solution of the problem along these lines.

Look Ahead

The obstacle that stands in the way of a sound policy in respect to preventing depressions is that most people will give the matter serious consideration only when the pains of hard times force the subject upon them. Then it is too late. What we need is an abundance of discussion of the matter now.

The problem of preventing hard times in an agricultural era was one of equalizing the food supply over a series of years. In our day of commerce, manufacturing and banking, the problem is that of equalizing business activity over a series of years. To do this we must carry over the surplus of business from the period of prosperity to the period of threatening depression. The time to began this process is the time of prosperity. The time to get ourselves in the frame of mind to adopt such a policy is the time of depression.

The difficulties in the way of carrying out the program here suggested are very great. The difficulties that will continue to be encountered, cycle after cycle, unless some solution is found, are greater. It is this sea of troubles against which we should now take up arms and by prevention reduce them.

(*With acknowledgement to the Society of Industrial Engineers.*)

Price Cutting to Increase Sales is a Fallacy

A Cut of Ten Per Cent. in Price Requires an Increase of Seventy Per Cent. in Volume to Give Same Total Profit

By KEITH E. POWLINSON

Forest Production Association of Maryland

THE desire of every business man is to make larger profits. To this end it is your main objective at the present time to increase your volume. If so, is it because your profits were too small last year, and you want to embark on an era of big business? Is it because you need money to meet obligations coming due? Or is it because you think you can reduce your carrying charges by securing greater volume and thus strengthen your competitive position? Whatever your reason may be the essential question is, are you going to increase your volume by shaving your prices or by improving your efficiency in handling and merchandising?

The real test of the legitimacy of a business is its profits. No business that is unsound ethically will continuously yield a profit. If you are endeavoring to become a better merchandiser you have the encouragement and congratulations of every real business man. On the other hand, if you are saying to yourself, "I must get more volume because I need the money to pay my bills or to increase my profits, and I am going to cut my prices to get it," you are looking at only one side of the picture.

Requires Large Increase

Few wood workers realize how much they must increase the volume of their business to make the same profit after the price is cut. You know that you must make a gross profit of 25 per cent. on the merchandise that you sell. Therefore, you add 33 1/3 per cent. to the handling cost of the material—thus—

Sales price	$100.00
Cost of material	75.00
Gross Profit	$ 25.00

You are told that your price is too high. You know that it is as low as you can go and make a normal profit, but you decide that it is more import-

ant to get volume—to keep your plant busy—and you cut your price 5 per cent. Then you have—

Sales price	$ 95.00
Cost of material	75.00
Gross Profit	$ 20.00

Cost of material and cost of doing business have not changed, but five dollars of profit have been sacrificed, which must be made up by greater volume.

KEITH E. POWLINSON

To regain the five dollars gross profits thus lost 25 per cent. additional business must be obtained. Thus—

25% added to sales price of $95.00	$118.75
25% added to cost of material, $75.00	93.75
Gross profit	$25.00

A cut of 10% requires **70% more business.** Thus—

70% added to sales price of $90,000	$153.00
70% added to cost of material, $75.00	127.50
Gross profit	$25.50

While a cut of 15% requires **150% more business.** Thus—

150% added to sales price of $85.00	$212.50
150% added to cost of material, $75.00	187.50
Gross profit	$25.00

The above figures do not take into consideration the increase in operating expenses which result from the policy of attempting to build volume by undercutting competitors.

EFFECT OF VOLUME ON COSTS

As a matter of fact the larger volume:

1—Increases investment on which interest must be earned.

2—Requires additional warehouse expense to handle stock.

3—Adds to sales expense.

4—Increases clerical and bookkeeping expenses in recording transactions.

5—Adds to credit risk and losses through charged off and uncollectable accounts.

When the above are all accounted for the volume necessary to justify cutting prices is tremendously greater than the figures here presented indicate.

Lumber and millwork is a staple commodity—a necessity. Its consumption is not materially increased or decreased by price changes. Where are you going to get the volume necessary to justify cutting your price? Except within narrow limits, it must be taken from your competitor. If you have to lose money to get it away from him, why not merchandise your lumber so that there will be a profit in it for every wide-awake dealer. The experience of trade associations and accounting firms has been that more losses and failures are caused by this fallacious policy than by any other. Price-cutting to get volume in 99 cases out of every 100 results in:

1—Smaller profits or larger losses because sufficient volume could not be obtained.

2—Upsetting a stable market or making an unstable one more erratic.

3—Increasing overhead.

4—Educates the buying public to prices which are not justified by the economic laws governing supply and demand.

We as millwork manufacturers and lumber dealers, may as well take a page from the manufacturers of lumber substitutes. They have built up a tremendous volume at our expense. They have not done it by price-cutting, but by real scientific and progressive merchandising. After securing volume they have in some cases reduced their prices, but only when conditions justified it.

(With acknowledgment to "The Canadian Woodwork and Furniture Manufacturer.")

NOTE.—The material for Mr. Powlinson's article was originally prepared by Mr. Harry Coleman of Wolfe & Co., Chicago, Ill., from an analysis made by the Harvard University.

The secret of economical production of power is the use of Exhaust Steam. No central generating station can compete with a plant which utilizes its exhaust steam at any pressure. The by-product, power, of such a plant is usually cheaper even than the cheapest water power. It may well be termed "The Cheapest Power in the World."—"Factory."

RESEARCH DEPARTMENT

Under the Direction of J. E. Carruthers.

MEMBERS' PROBLEMS

Problem 4.

A firm makes an article that goes successively through a number of processes. There is a standard cost for each process and there is a complete inventory control of goods in process. The finished goods are warehoused and valued at the standard finished cost price. By means of these standard process cost prices the profit or loss on each process is found, and when the goods are shipped the profit or loss on the selling price is arrived at. The object of the cost system was to separate the profits or losses incurred in manufacturing from those incurred by the fixing of a selling price.

The firm has recently manufactured large quantities of an article on which the selling price will be less than the finished standard cost price. Considerable quantities of this article have been made and are in warehouse. It is obviously wrong to take them into inventory at the standard cost valuation as that would result in an inflation of inventory. On the other hand, the different processes are entitled to a standard credit for the work performed. The total of these standard credits, plus the material cost, obviously equals the finished standard cost.

At what point should the loss be taken?

Problem 1.

Printed in our issue of October.

Suggested Reply.

We should say it would be generally considered poor cost accounting practice to charge all general overhead charges to an established Home Trade branch, leaving the new export business to carry only its prime cost and any increased overhead or expenses incidental to the export trade alone.

Cost of production as we view it has nothing to do either with ultimate profit or with the market in which the production is disposed of. Cost of production is the cost to produce—and new articles should bear their proportion of all production costs even though this may lessen production costs of articles made for the Home trade. In other words, new articles for export must share with older articles for the home trade such part of the total expenditures as facilitate their manufacture.

Problem 3.

Printed in our issue of October.

Suggested Reply.

To charge overhead on a poundage basis would involve a heavy sheet paying part of the overhead of a lighter sheet of the same superficial area, but from a metal having a lower specific gravity.

The most accurate method, so long as it does not become too complicated (and this we cannot say without an intimate knowledge of the business in question and its working conditions) would probably divide the overhead into two or more divisions. Part of the overhead would be fairly distributed on the basis of weight. Such, for instance, as certain handling costs.

Another part could be allocated on the superficial area, or per unit of sheets processed, such as machinery and power overhead, while insurance and waste could be distributed on the basis of sheet value and supervision on the labor payroll.

After splitting the overhead into its component parts a separate percentage might be worked out for each class of material and then applied either on poundage or superficial area basis.

It seems quite apparent that a uniform fixed percentage could not easily be arrived at which would fairly distribute overhead to each of the different classes.

Problem 4.

Appearing in this issue.

Suggested Reply.

Cost appears to be the logical basis for valuing inventories, but as a basis for determining profits under all conditions from a valuation of current assets, it is subject to criticism.

Prima facie a manufacturer expects to sell his inventory at a price which will yield over and above the inventoried value, a due proportion of selling, distributing and administration expenses plus the usual estimated profit. If we take the anticipated sales price and reduce it by selling, distributing, administration expenses and profits, the remainder is surely the true inventory value even though it be less than cost or replacement figures. Incidentally this method should not be permitted to increase inventory values as this would infringe what has been described as "one of the most strongly entrenched theories of balance, sheet construction, namely, that no profits must be anticipated and all losses must be provided for. Not to recognize a lowered future selling price may be courting future financial embarrassment." Kohler & Morrison's "Principles of Accounting."

In order to preserve the inter-departmental credits as brought into inventory, should the difference between actual cost and *reduced* cost as evidenced by diminished selling value not be a charge to profit and loss account? It is an anticipated loss from what inventory figures based either on cost or replacement ought to realize.

Positions Available

The two positions for Cost Accountants advertised in our last issue have now been filled.

Firms making use of our columns may rely upon being promptly put in touch with qualified men.

Positions Desired

No. 253—Age 27. Experience as office manager with charge of general accounting and cost work, distribution and analysis of cost figures, monthly profit and loss statements. Acquainted with secretary-treasurer's duties. Salary, $2,500.

No. 254—Age 32, married, 10 years cost experience; last 8 years in full control cost department of large firm. Salary, $2,500.

No. 255—Age 36, married, 14 years cost accounting, covering installation of system, time study, payroll distribution, material control and productive work; comparative reports and monthly statements.

No. 256—Experienced Accountant, 5 years Chartered Accountant's office; full range of accountancy work including costing. Good references.

No. 257—Junior position—10 years' experience accountancy and cost work; cost estimation and analysis.

No. 258—Cost Accountant, at present in full charge of cost department; experience in different plants; also 4 years' general office work. Student of La Salle and Alex. Hamilton Institute.

No. 259—9 years in Maritimes; full experience casting valves and fittings, both brass and iron; competent in piece work and production management.

No. 260—22 years, single; 2½ years as assistant Cost Accountant in large box factory; general office experience and sales. Salary, $1,200 to $1,500.

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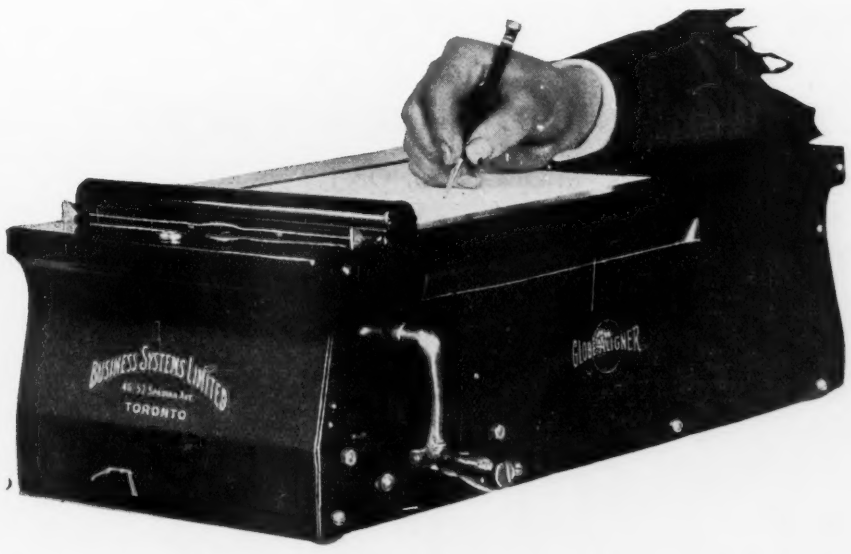

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The objects of the Canadian Society of Cost Accountants may be summarized as follows:—

1. To promote the study and application of the SCIENCE OF COST ACCOUNTING.
2. To develop and foster in Commerce and Industry a wider knowledge of Cost Accounting Methods and Principles.
3. To provide an organization by means of which the members thereof may be enabled to increase their proficiency in all matters relating to Cost Accounting and other branches of Commercial and Industrial Administration and Management.
4. To render available to its membership the best literature on subjects connected with Costs and Administration.
5. To afford a medium for the Solution of Problems interesting to its Membership and for the development of Cost Accounting as a Science.
6. To offer by means of open meetings a Forum for the discussion of problems and the interchange of views.

Membership is not restricted to any one class or profession, but includes Executives, Accountants, Factory and Plant Managers, Industrial Engineers and others to whom the activities and scope of the Society have a direct appeal.
The fee for membership in the Society is Twenty Dollars per year, payable in advance on the first day of March of each year or, at the option of the member, in two half-yearly instalments of equal amount, payable respectively on the first day of March and the first day of September of each year.

The Canadian Society of Cost Accountants

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I hereby apply to be admitted a Member of The Canadian Society of Cost Accountants and undertake if admitted to observe all the By-laws and Regulations of the Society for the time being in force.

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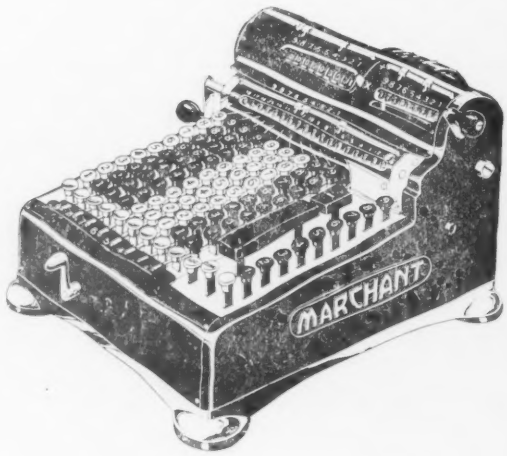

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